A Message from the President

Welcome to the University of Calgary's energetic and diverse community of students, faculty, staff and alumni.

The University of Calgary is Canada's leading next-generation university, and we are proud to offer an abundance of academic opportunities, extracurricular activities, cultural events and athletics for you to enjoy. Our beautiful campus in northwest Calgary is the proud home to state-of-the art facilities like the Taylor Institute for Teaching and Learning, Outdoor Centre, Olympic Oval, Taylor Family Digital Library and the award-winning Energy, Environment, Experiential Learning (EEEL) building; we also have four satellite campuses: Downtown, Foothills, Spy Hill and the University of Calgary in Qatar.

We are committed to providing a transformative environment that nurtures discovery, creativity and innovation. At the start of the year, we encourage all of our students to get involved in campus activities – to participate in Orientation Week and the Common Reading Program, to embrace the numerous leadership opportunities available and to participate in community support activities like our annual United Way Campaign, UCalgary Strong and the Campus Mental Health Strategy initiatives.

You are here to begin a journey of growth, building a strong foundation for the rest of your life and we are dedicated to providing you with unique and challenging opportunities based on ambitious scholarship, ethical leadership and engaged citizenship. Students are also encouraged to take advantage of programs and funding offered through University of Calgary International (UCI) to study, volunteer or work overseas. These international programs will broaden your perspective and add dimension to the teaching, learning and research on our campus.

This is an especially vibrant time on our campus. Now that the University of Calgary has reached its milestone 50th anniversary, there is a renewed commitment towards the future. We have developed a strong foundational system that allows for nimbleness and welcomes diversity.

We are moving forward, building ties with our surrounding community, enriching our teaching and learning environment and constructing new, leading-edge facilities for our students like the Schulich School of Engineering expansion.

The University of Calgary, like our students, is maximizing our potential: expanding our research expertise, leading by example in the community and engaging with the dynamic environment of the enterprising city we call home.

Welcome to the University of Calgary!

Elizabeth Cannon
President

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For detailed information about the Faculties of Graduate Studies, Law and Medicine (MD), please consult the individual Faculty calendars.

The online Calendar is the official University Calendar. The Calendar is available in electronic form on our website: ucalgary.ca/pubs/calendar/.

Calendar Production

The University of Calgary extends its gratitude to all those dedicated individuals who contributed time and effort towards this Calendar.

University Registrar: Angelique Saweczko
Co-Chairs of the Calendar and Curriculum Subcommittee: Drs. Susan Barker and Cindy Graham
Editor: Carol Poland, Enrolment Services
Technical Production Specialist: Philip Tsang, Enrolment Services
Production Manager: France Lego, Imagine Printing Services
Cover Design: Student and Enrolment Services

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2500 University Drive N.W.,
Calgary, Alberta, Canada
T2N 1N4

Main Switchboard: 403.220.5110

Web address: ucalgary.ca

A limited number of complimentary copies of this Calendar are available to some public institutions.
Please contact 403.220.6642 or calendar@ucalgary.ca.

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Important Notice and Disclaimer

The material and information in this Calendar is compiled from academic and administrative office submissions and are time-sensitive. Every reasonable effort is made to ensure it is correct and accurate at the time of publication, but inaccuracies and errors may occur. If there is an inconsistency or conflict between the general academic regulations and policies published in the Undergraduate Calendar, and such regulations and policies as established by resolution of a Faculty or of the University General Faculties Council, the regulations and policies version as approved by the Faculty or the University General Faculties Council will prevail.

By the act of registration with the University of Calgary, each student shall be deemed to have agreed to be bound by the regulations and policies of the University and of the program in which that student is enrolled as well as any relevant Faculty policies and regulations.

Students are responsible for familiarizing themselves with the general information, rules and regulations contained in the Calendar, and with the specific information, rules and regulations of the Faculty or Faculties in which they are registered or enrolled or seek registration or enrolment, as well as the specific requirements of each degree, diploma or certificate sought. It is the student's responsibility to ensure that the courses chosen are appropriate to the program and graduation requirements.

Students should note that not every course listed in the Calendar is offered every year, nor does being admitted into a program guarantee space in any given course.

The University of Calgary has the responsibility and **reserves the right to make changes in the information contained in the Calendar, in either its printed or electronic form**, and will provide as much notice as administratively possible in effecting such change.

The University of Calgary does not accept, and hereby expressly disclaims, any and or all responsibility or liability to any person, persons or group, either direct or indirect, consequential or otherwise, arising out of any one or more of such changes and, specifically, the University hereby disclaims liability to any person who may suffer loss as a result of reliance upon any information contained in this Calendar.

The University of Calgary disclaims all responsibility and liability for loss or damage suffered or incurred by any student or other party as a result of delays in or termination of its services, courses, or classes by reason of force majeure, pandemics, public health emergencies, fire, flood, riots, war, strikes, lockouts, damage to University property, financial exigency or other events beyond the reasonable control of the University. The University also disclaims any and all liability for damages arising as a result of errors, interruptions or disruptions to operations or connected with its operations or its campuses, arising out of computer failure or non-compliance of its computing systems.

Effective with the 2008/2009 edition, the online Calendar is the official University Calendar.

Academic Schedule

2016-2017 Academic Dates and Deadlines

Courses taught according to non-standard dates have different drop, add and withdrawal deadlines. Please refer to the student center for details regarding those deadlines specific to your course(s). In addition, and in accordance with Faculty regulations, some courses will require Faculty approval to drop, add or withdraw from courses. The academic schedule may be updated online when required and as needed.

The schedules for the Faculties of Environmental Design, Graduate Studies, Law and the Cumming School of Medicine may have different start and end dates.

	Fall Term 2016	Winter Term 2017	Spring/ Summer Term 2017	Spring Intersession 2017	Summer Intersession 2017
Academic Dates					
Start of Term	Tuesday, September 6	Monday, January 2	Monday, May 8	Monday, May 8	Tuesday, July 4
End of Term	Friday, December 23	Friday, April 28	Thursday, August 31	Friday, June 30	Thursday, August 31
Block Week	Tuesday-Saturday, September 6-10	Monday-Friday, January 2-6			
Start of Classes	Monday, September 12	Monday, January 9	Monday, May 15	Monday, May 15	Tuesday, July 4
Mid-Term Break	Thursday-Sunday, November 10-13	Sunday-Sunday, February 19-26			
End of Classes	Friday, December 9	Wednesday, April 12	Wednesday, August 16	Tuesday, June 27	Wednesday, August 16
Start of Exams	Monday, December 12	Saturday, April 15	Friday, August 18	Wednesday, June 28	Friday, August 18
End of Exams	Thursday, December 22	Wednesday, April 26	Monday, August 21	Friday, June 30	Monday, August 21
Registration Dates					
Last day to drop a class without financial penalty*	Friday, September 23	Friday, January 20	Friday, May 19	Friday, May 19	Monday July 10
Last day to add a course	Monday, September 26	Monday, January 23	Friday, May 19	Friday, May 19	Monday, July 10
Last day to withdraw from a course**	Friday, December 9	Wednesday, April 12	Wednesday, August 16	Tuesday, June 27	Wednesday, August 16
Tuition and Refund Dates					
End of refund period	Friday, September 23	Friday, January 20	Friday, May 19	Friday, May 19	Monday July 10
Tuition and Fee Payment Deadline	Friday, September 30	Friday, January 27	Wednesday May 24	Wednesday May 24	Wednesday July 12
Important Dates					
Deadline to Apply for Fall Convocation	Thursday, September 15				

Fall Convocation	Thursday, November 10				
Deadline to Apply for Winter Conferral of Degree		Sunday, January 15			
Winter Conferral of Degree		Friday, February 17			
Deadline to Apply for Spring Convocation		Thursday, March 31			
Spring Convocation				Monday-Friday, June 5-9	
Recognized Holidays (University Closed)					
Labour Day	Monday, September 5				
Thanksgiving Day	Monday, October 10				
Remembrance Day	Friday, November 11				
Holiday Observance	Sunday-Saturday, December 25-31				
New Year's Day	Sunday, January 1				
Alberta Family Day		Monday, February 20			
Good Friday		Friday, April 14			
Victoria Day				Monday, May 22	
Canada Day				Saturday, July 1	
Alberta Heritage Day					Monday, August 7

**There will be no academic record of a course that is dropped by this date and tuition will be refunded.*
***There will be a "W" recorded for the course and tuition will not be refunded.*

Tentative Future Dates

The following dates are tentative and subject to review and change.

Fall 2017

Classes Begin
- Monday, September 11

Classes End
- Friday, December 8

Final Exams
- Monday-Thursday, December 11-21

Winter 2018

Classes Begin
- Monday, January 8

Classes End
- Friday, April 13

Final Exams
- Monday-Thursday, April 16-26

Spring 2018

Classes Begin
- Monday, May 14

Classes End
- Tuesday, June 26

Final Exams
- Thursday-Saturday, June 28-30

Summer 2018

Classes Begin
- Tuesday, July 3

Classes End
- Wednesday, August 15

Final Exams
- Friday-Saturday; Monday August 17-18; 20

Fall 2018

Classes Begin
- Monday, September 10

Classes End
- Tuesday, December 4

Final Exams
- Friday-Tuesday, December 7-18

Winter 2019

Classes Begin
- Wednesday, January 9

Classes End
- Friday, April 12

Final Exams
- Monday-Friday, April 15-26

Spring 2019

Classes Begin
- Monday, May 13

Classes End
- Tuesday, June 25

Final Exams
- Thursday-Saturday, June 27-29

Summer 2019

Classes Begin
- Tuesday, July 2

Classes End
- Wednesday, August 14

Final Exams
- Friday-Saturday; Monday, August 16-17; 19

Fall 2019

Classes Begin
- Monday, September 9

Classes End
- Friday, December 6

Final Exams
- Monday-Thursday, December 9-19

Winter 2020

Classes Begin
- Wednesday, January 8

Classes End
- Tuesday, April 14

Final Exams
- Friday-Tuesday, April 17-28

Spring 2020

Classes Begin

- Monday, May 11

Classes End

- Tuesday, June 23

Final Exams

- Wednesday-Friday, June 24-26

Undergraduate Degrees with a Major

Faculty	Degree	Years	Major
Arts	BA	4	Ancient and Medieval History*
	BA	4	Anthropology, Social and Cultural*
	BSc	4	Anthropology*
	BA, BSC	4	Archaeology*
	BA	4	Canadian Studies*
	BA, BSc	4	Communication and Culture*
	BCC	3	Communication and Culture
	BA, BCMS	4	Communication and Media Studies*
	BA	4	Development Studies*
	BSc	4	Earth Science*
	BA	4	East Asian Language Studies*
	BA	4	East Asian Studies*
	BA	4	Economics*
	BA	4	English*
	BA, BFS	4	Film Studies*
	BA	4	French*
	BA, BSc	4	Geography*
	BA	4	German*
	BA	4	Greek and Roman Studies*
	BA	4	History*
	BA	4	History and Philosophy of Science*
	BA	4	International Indigenous Studies*
	BA	4	International Relations*
	BA	4	Italian Studies*
	BA	4	Latin American Studies*
	BA	4	Law and Society*
	BA	4	Linguistics*
	BA	4	Linguistics and Language*
	BA	4	Philosophy*
	BA	4	Political Science*
	BA, BSc	4	Psychology
	BA	4	Religious Studies*
	BA	4	Religious Studies and Applied Ethics*
	BA	4	Russian
	BA, BSc	4	Science, Technology and Society*
	BA	4	Sociology*
	BA	4	Spanish*
	BA	4	Urban Studies*
	BA	4	Women's Studies*
Cumming School of Medicine	BCR	4	Community Rehabilitation
	BHSc	4	Bioinformatics
	BHSc	4	Biomedical Sciences
	BHSc	4	Health and Society
	MD	3 after preprof.	Doctor of Medicine
Fine Arts	BA	4	Art History
	BA	4	Dance
	BA	4	Music
	BFA	4	Drama
	BFA	4	Visual Studies
	BMus	4	Music
Haskayne School of Business	BComm	4	Commerce*
	BHRM	4	Hotel and Resort Management
Kinesiology	BKin	4	Athletic Therapy
	BKin	4	Biomechanics
	BKin	4	Exercise and Health Physiology
	BKin	4	Kinesiology
	BKin	4	Leadership in Pedagogy and Coaching
	BKin	4	Mind Sciences in Kinesiology
	BSc	4	Biomechanics
	BSc	4	Exercise and Health Physiology
	BSc	4	Kinesiology
	BSc	4	Mind Sciences in Kinesiology
Law	JD	3 after preprof.	Law
Nursing	BN	4	Nursing
Schulich School of Engineering	BSc	4	Chemical Engineering†
	BSc	4	Civil Engineering†
	BSc	4	Electrical Engineering†
	BSc	4	Energy Engineering†
	BSc	4	Geomatics Engineering†
	BSc	4	Mechanical Engineering†
	BSc	4	Oil and Gas Engineering†
	BSc	4	Software Engineering†
Science	BA	4	Computer Science
	BSc	4	Actuarial Science*
	BSc	4	Applied and Environmental Geology
	BSc	4	Applied Chemistry**
	BSc	4	Applied Mathematics
	BSc	4	Astrophysics
	BSc	4	Biochemistry
	BSc	4	Biological Sciences
	BSc	4	Cellular, Molecular and Microbial Biology
	BSc††	4	Chemical Physics
	BSc	4	Chemistry
	BSc	4	Computer Science
	BSc	4	Ecology*
	BSc	4	Environmental Science
	BSc	4	General Mathematics
	BSc	4	Geology
	BSc	4	Geophysics
	BSc	4	Natural Sciences

	BSc††	4	Neuroscience
	BSc	4	Physics
	BSc	4	Plant Biology
	BSc	4	Pure Mathematics
	BSc	4	Statistics
	BSc	4	Zoology
Social Work	BSW	4	Social Work
Veterinary Medicine	DVM	4	Doctor of Veterinary Medicine
Werklund School of Education	BEd	2 (consecutive)	Elementary
	BEd	2 (consecutive)	Secondary
	BEd	4 (community-based)	
	BEd	5 (concurrent)	Elementary
	BEd	5 (concurrent)	Secondary

† *Internship option available*
†† *Honours only*
**Co-operative Education option available*
***Co-operative Education option only*

Combined Degrees

Two degrees offered by two Faculties or within one Faculty requiring a minimum of five years to complete.

Faculties	Degree	Years	Major
Arts	BA/BA BA/BSc BSc/BSc BFA/BA or BFA/BSc	5	Most Majors in Arts (see Faculty of Arts Regulation 3.4.5.)
Arts/Haskayne	BA/BComm or BSc/BComm	5	See Haskayne School of Business - Combined Programs for a list of eligible Majors in Arts/Commerce
Arts/Kinesiology	BA/BKin	5	Dance/Kinesiology (Kinesiology)
Arts/Medicine	BA/BCR or BSc/BCR	5	Psychology/Community Rehabilitation and Disability Studies
Arts/Werklund	BA/BEd BFA/BEd BMus/BEd BSc/BEd	5 5 5 5	See Faculty of Arts - Concurrent Programs for a list of eligible Majors in Arts/Education
Haskayne/ Kinesiology	BComm/BKin	5	Commerce/Kinesiology (Kinesiology)
Haskayne/ Science	BComm/BSc	5	Commerce/Actuarial Science or Computer Science
Kinesiology/ Werklund	BKin/BEd	5	Kinesiology (Leadership in Pedagogy and Coaching)/Education
Schulich/Arts	BSc(Eng)/BA or BSc	5	All Majors in Schulich/All Majors in Arts
Science	BSc/BSc or BSc/BA	5	Most Majors in Science (see Faculty of Science Regulation 3.4.F.)
Science/Arts	BSc/BSc, BSc/ BA, BA/BSc or BA/BA	5	All Majors in Science/All Majors in Arts
Science/ Schulich	BSc/BSc	5	All BSc majors in Science and all majors in Schulich. See Schulich School of Engineering 4.12.
Science/ Werklund	BSc/BEd	5	General Mathematics in Education/ Education Natural Sciences/Education

Minor Programs

Arts	African Studies; Anthropology; Applied Energy Economics; Archaeology; Canadian Studies; Chinese; Communication and Media Studies; Dance; Development Studies; Drama; Earth Science; East Asian Studies; Economics; English; Film Studies; French; Geography; German; Greek; Greek and Roman Studies; History; History and Philosophy of Science; International Indigenous Studies; Italian Studies; Japanese; Latin; Latin American Studies; Law and Society; Linguistics; Medieval, Renaissance and Reformation Studies; Museum and Heritage Studies; Music; Philosophy; Political Science; Psychology; Religious Studies; Russian; Science, Technology and Society; South Asian Studies; Sociology; Sonic Arts; Spanish; Speech-Language Sciences; Urban Studies; Visual Studies and Art History; Women's Studies
Continuing Education	Workplace Learning
Cumming School of Medicine	Adapted and Therapeutic Physical Activity; Community Rehabilitation and Disability Studies; Health and Society
Environmental Design	Architectural Studies
Haskayne School of Business	Management and Society
Science	Actuarial Science; Applied Mathematics; Astrophysics; Biological Sciences; Chemistry; Computer Science; Geology; Geophysics; Nanoscience; Physics; Pure Mathematics; Statistics

Student and Campus Services

Student and Enrolment Services

Enhancing the Student Experience

Student and Enrolment Services (SES) is committed to fostering a community that values student engagement, challenges students to explore their potential and supports each student's success through the provision of best practice services and programs that enhance the student experience in support of the Eyes High strategy of the University of Calgary.

Contact Information:

Vice-Provost (Student Experience):
Susan Barker, PhD

Telephone: 403.220.6580

Email: vpse@ucalgary.ca

Location: MacKimmie Block 137

Registrar: Angelique Saweczko

Telephone: 403.220.3833

Email: registrar@ucalgary.ca

Location: MacKimmie Block 124

Senior Director, Student Services:
Jennifer Quin, BA, MSc

Telephone: 403.210-6300

Location: MacEwan Student Centre, 293

Director, SU Wellness Centre:
Debbie Bruckner

Telephone: 403.210.8904

Location: MacEwan Student Centre, 370

Website: ucalgary.ca/ses/

Career Services

Manager: Colleen Bangs

Programs and services at Career Services include one-to-one career development and education, career workshops, access to full-time, summer, part-time and co-op and internship positions.

Telephone: 403.220.8020

Fax: 403.282.8342

Recruiting: recruit@ucalgary.ca

Student inquiries: csstdnt@ucalgary.ca

Location: MacEwan Student Centre 188

Website: ucalgary.ca/careers

Centre for Community-Engaged Learning

The Centre for Community-Engaged Learning supports curricular and co-curricular service-learning programs. The CCEL supports students' learning and leadership development and encourages life-long community engagement through projects and partnerships with the non-profit sector.

Telephone: 403.210.7998

Fax: 403.210.9877

Location: MacEwan Student Centre 295

Website: ucalgary.ca/CCEL

Enrolment Services

Enrolment Services assists students in carrying out a variety of administrative functions at the University of Calgary. Enrolment Services provides services over the phone, online (via MyUofC online Student Centre and in-person in the following areas: prospective student inquiry, admissions, student awards and scholarships, course registration support, financial aid and student fees.

Contact Information:

Telephone: 1.403.210.7625*

Fax: 1.403.289.1253

Location: MacKimmie Block 117

Website: ucalgary.ca/registrar

Hours of Operation: Monday to Friday - 09:30-16:30, and Thursday - 10:00 - 16:30**

**Limited information and service can be provided on the phone due to the Freedom of Information and Protection of Privacy Act legislation.*

***Enrolment Services may stop generating tickets prior to 4:30 depending on service demands.*

Enrolment Services may experience temporary closures throughout the year for staff training and professional development. For current updates on closures and wait times please visit: ucalgary.ca/currentstudents/serviceinformation.

Faith and Spirituality Centre

The Faith and Spirituality Centre (FSC) is a religious positive space that is open to engaging all viewpoints; regardless of belief, tradition, or spiritual outlook and including those that are questioning or seeking.

Telephone: 403.220.5451

Email: artuliss@ucalgary.ca

Location: MacEwan Student Centre 373

Website: ucalgary.ca/fsc

International Student Services

Ricky Ramdhaney, Manager International Student Services

International Student Services (ISS) provides support services and customized advising for all international students adjusting to studying at the University of Calgary and to life in Canada. Our leadership initiatives develop, design and deliver unique peer-driven programs that connect international and Canadian students.

Telephone: 403.220.5581

Fax: 403.289.4409

Email: international.advice@ucalgary.ca

Location: MacEwan Student Centre 275

Website: ucalgary.ca/iss/

Leadership and Student Engagement

Leadership and Student Engagement (LSE) is dedicated to providing all University of Calgary students with the opportunity to develop their leadership identities. We provide a well-rounded university experience from first-year through to graduation.

Telephone: 403.210.5824

Fax: 403.210.9877

Location: MacEwan Student Centre 293

Website: ucalgary.ca/leadership

Native Centre

Director: Shawna Cunningham, BA, MA

The University of Calgary welcomes, respects, and supports the rich diversity of Aboriginal learners, their communities, cultural traditions, and aspirations in post-secondary education. The Native Centre provides academic, personal, and cultural support to prospective and current First Nations, Métis, and Inuit students. Through student engagement and cultural events, the Native Centre also strives to create a welcome, inclusive, and inter-cultural edu-

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cational environment for the whole campus community.

Telephone: 403.220.6034

Fax: 403.220.6019

Location Room 390z MacEwan Student Centre

Website: ucalgary.ca/nativecentre

Recruitment and Admissions

The Recruitment and Admissions Office acts as the first point of contact for prospective students who are interested in attending an undergraduate program at the University of Calgary.

Services for prospective students include application and admission advising, presentations at Canadian high schools, undergraduate application and admission services for both domestic and international applicants, and evaluation of domestic and foreign credentials.

Telephone: 403.210.7625

Fax: 403.220.0762

Email: future.students@ucalgary.ca

Location: MacKimmie Block 117

Website: ucalgary.ca/prospectivestudents

Scholars Academy

Co-ordinator: Jessica Cohen, PhD

The Scholars Academy provides talented students with the privilege of developmental opportunities that enhance their eligibility for prestigious scholarships and graduate/professional programs. Admission to the Scholars Academy requires students to be at the top of their class academically (minimum 3.60 CGPA). Students are also chosen based on a demonstrated ability to make the most of offered opportunities and their commitment/involvement in the community.

Telephone: 403.220.2625

Email: sap@ucalgary.ca

Website: ucalgary.ca/sap

Student Accessibility Services

Manager: Johanne Tottle, PhD

The Student Accessibility Services works collaboratively and innovatively with the campus community to create an accessible, equitable and supportive learning and living environment that enhances each student's academic and personal development.

Telephone: 403.220.8237

Fax: 403.210.1063

TTY: 403.220.2823

Email: access@ucalgary.ca

Location: MacEwan Student Centre 452

Website: ucalgary.ca/access

Student Awards Office

Manager: Claudia Barrett

The Student Awards Office in Enrolment Services provides undergraduate scholarships, bursaries and awards to entering and continuing students to recognize academic achievement and provide financial support for their post-secondary studies.

For further information on student awards for undergraduate students, refer to the Awards and Financial Assistance section of this Calendar.

Telephone: 403.210.7625

Fax: 403.282.2999

Email: ucawards@ucalgary.ca

Location: MacKimmie Block Room 117

Website: ucalgary.ca/awards/

Student Ombuds Office

The Student Ombuds Office offers a safe place for undergraduate and graduate students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.

For an appointment with the Student Ombuds, please send your request via email, call, or book an appointment online.

Telephone: 403.220.6420

Email: ombuds@ucalgary.ca

Website: ucalgary.ca/ombuds/

Student Success Centre

Manager: Roxanne Ross, BA, MA

The Student Success Centre provides services and programs to undergraduate, graduate, international or open studies students. Our advisors, learning support staff, and writing support staff are here to assist you in enhancing your skills and achieving your academic goals.

Telephone: 403.220.5881

Fax: 403.220.0190

Location: Taylor Family Digital Library, 3rd Floor

Website: ucalgary.ca/ssc

SU Wellness Centre

Senior Director, Student Wellness, Access and Support: Debbie Bruckner

The SU Wellness Centre feels we all have a role to play in creating a healthy campus community, which is about working collaboratively to create a campus environment where students, faculty and staff feel empowered to support each other and participate actively in maintaining their own health and well-being. With a student-centered approach, we offer comprehensive, holistic and accessible programs and services to foster all dimensions of wellness.

Counselling

Programs and services at the Counselling Centre include individual counselling and relationship support; online self-help; educational success strategies and career decisions. Whether you are a successful student looking to brush up on your skills, are concerned about a friend, or in crisis, the Counselling Centre can help you identify ways to improve your well-being and achieve your goals.

Telephone: 403.210.9355 (WELL) #2 for Counselling

Fax: 403.284.0069

Location: MacEwan Student Centre 370

Website: ucalgary.ca/wellnesscentre/counselling/

Events and Programs

Building resiliency and capacity by offering innovative events and programs to promote wellness in mind, body and spirit.

Telephone: 403.220.5352

Email: amhumeni@ucalgary.ca

Location: MacEwan Student Centre 370

Website: ucalgary.ca/wellnesscentre/events-programs

Health Services

Promoting and monitoring physical wellness for students and their dependents through access to medical, chiropractic, massage and nutrition services.

Telephone: 403.210.9355 (WELL) #3 for Health Services

Fax: 403.282.5218

Location: MacEwan Student Centre 370

Website: ucalgary.ca/wellnesscentre

Student Support and Outreach

Support and outreach to students to address immediate and ongoing mental health needs. A multi-disciplinary team provides mental health information, referrals, help in developing personal coping strategies and response for reported students-at-risk.

Telephone: 403.220.9355 (WELL) #2 for Counselling

Fax: 403.282.5218

Location: MacEwan Student Centre 373

Website: ucalgary.ca/wellnesscentre/services/studentsupport

Women's Resource Centre

Co-ordinator: Nanako Furuyama

The Women's Resource Centre provides a safe and supportive place to advance gender equality and build community where all experiences are valued, and everyone is offered the resources necessary to make informed choices.

Telephone: 403.220.8551

Fax: 403.210.7970

Email: women@ucalgary.ca

Location: MacEwan Student Centre 482

Website: ucalgary.ca/women/

Hours: Monday to Friday, 8:30 a.m. – 4:30 p.m.

Active Living

As a University of Calgary student, you are automatically an 'all-access' member of one of Calgary's largest and most complete recreation facility. Students can also purchase family memberships at special student rates. Community members, alumni and staff are also welcome to become members.

Our facilities include a Fitness Centre, Racquet Centre, Aquatic Centre, Gymnastics Centre, and Outdoor Centre. Active Living offers a wide variety of programs from health and wellness, to recreation programs and certifications.

Look for Active Living and Outdoor Centre Program Guides in display racks located around campus.

Telephone: 403.220.7749 or 403.220.5029

Location: Kinesiology Complex

Website: ucalgary.ca/activeliving

Bookstore

The University of Calgary Bookstore is where you'll find textbooks and other course materials, Dinos gear and merchandise, books for leisure reading, gift items, school supplies and a full-service Starbucks to help you refuel any time of day.

Telephone: 403.220.5937

Email: bkstore@ucalgary.ca

Location: First floor, MacEwan Student Centre, 424 Collegiate Blvd. N.W.

Website: calgarybookstore.ca

Hours of operation: Monday to Friday, 9:00 a.m. to 6:00 p.m., Saturday: 10:00 a.m. to 5:00 p.m.

All Bookstore proceeds stay on campus; supporting student programming, academic, and research initiatives.

Campus Security

Campus Security is dedicated to maintaining the campus as a safe and pleasant place to live, work and study. Officers are on duty 24 hours a day, year round, to respond to your security and emergency needs. Campus Security, in partnership with the Students' Union, provides a Safewalk service to any location on campus including the LRT, parking lots, bus zones and campus housing. Campus Security can be contacted from any of the "Help" phones located around campus.

Telephone: 403.220.5333

Fax: 403.282.2765

Location: MacEwan Student Centre, Room 260

Website: ucalgary.ca/security

Conference and Event Management

Centrally managing over 42,000 square feet of bookable classroom, boardroom, conference, and event space, 141 lecture theatres and more than 200 hectares of beautiful, park-like outdoor space, the Conference and Event Management (CEM) team is sure to find a creative solution for your event. Whether you need to arrange a multi-day conference, a business luncheon or a social event, our CEM staff will take care of all essential details.

Telephone: 403.220.3111

Email: mse@ucalgary.ca

Location: 169 University Gate N.W.

Website: ucalgary.ca/cem/

Office hours: Monday to Friday: 8:30 a.m. to 4:30 p.m.

All Conference and Event Management proceeds stay on campus; supporting student programming, academic, and research initiatives.

Dinos Athletics (The Interuniversity Athletic Program)

Dinos Athletics is a full member of the Canada West Universities Athletic Association. Canada West is one of the most competitive conferences in Canadian Interuniversity Sport (CIS). The Dinos compete in Canada West conference league sports including basketball, field hockey, football, ice hockey, rugby, soccer, and volleyball and in Canada West tournament sports including cross-country, swimming, track and field, and wrestling. All undergraduate and graduate students are admitted free of charge to all regular season games upon presentation of proper I.D.

Telephone: 403.220.6803

Email: goDinos@ucalgary.ca

Location: Kinesiology Complex A 147

Website: goDinos.com

Environment, Health and Safety

The University of Calgary is committed to providing a safe and healthy environment for students in which to learn. The EH&S Department provides leadership in the implementation of the University's Occupational Health and Safety and Environmental Management Systems, including WHMIS (Workplace Hazardous Materials Information System), radiation safety, and biohazardous materials. The EH&S website provides information on legislation; policies and procedures; safety courses and online registration; as well as other health and safety related information and guidance.

Telephone: 403.220.6345

Website: ucalgary.ca/safety

Food Services

University of Calgary Food Services oversees the food services operator, select retail outlets and catering on campus. The Dining Centre and 19 other food retailers across campus provides the campus community a variety of healthy choices. From coffee and baked goods, to dine-in table service locations, Food Services has something for nearly every preference.

Meal plans are managed by Food Services, in co-ordination with the Unicard office. Meal plans are available to anyone who has a Unicard. The cards are also loadable on an ad-hoc basis and can serve as a simple way to purchase food on campus (ucalgary.ca/unicard/use-unicard).

Telephone: 403.220.5541

Email: food.services@ucalgary.ca

Location: DC 18B, 2500 University Drive N.W.

Website: ucalgary.ca/ancillaryservices/foodservices

Hours of operation: Monday to Friday: 8:30 a.m. to 4:30 p.m.

All Food Services proceeds stay on campus; supporting student programming, academic, and research initiatives.

Hotel Alma

Hotel Alma treats guests to gracious service, affordable accommodations (special rates for staff and visiting families of students) and a host of meeting spaces. Accommodations include one, two and three bedroom apartments as well as traditional dormitory rooms and can accommodate groups of up to 1,122 people. Through the fall and winter season (late August through April), Seasonal Residence provides two bedroom, short-term residences to teams, student groups, exchange students, etc.

Telephone: 403.220.3203

Email: stay@hotelalma.ca

Location: 169 University Gate N.W.

Website: hotelalma.ca

Hours: 24-hours-a-day, seven-days-a-week

All Hotel Alma proceeds stay on campus; supporting student programming, academic, and research initiatives.

Information Technologies

The Information Technologies (IT) department provides computing and media services in support of learning, teaching, research, and administration at the University of Calgary.

IT supports many online services that students will utilize throughout their academic learning experience at the University of Calgary. For more information on IT services, visit ucalgary.ca/it/services.

Telephone: 403.220.5555 or 888.342.3802

Email: itsupport@ucalgary.ca

Twitter: @UCalgary_IT

Location: 7th Floor, Mathematical Sciences Building

Website: ucalgary.ca/it

Libraries and Cultural Resources

Libraries and Cultural Resources (LCR) operates eight University of Calgary libraries on campus and across the city. Included in LCR are two art galleries — the Nickle Galleries and the Founders' Gallery at The Military Museums — as well as Archives and Special Collections, the University of Calgary Copyright Office, Research Data Centre and the University of Calgary Press.

For more information, please refer to: lcr.ucalgary.ca/.

Parking and Transportation Services

Parking and Transportation Services is your one-stop shop for all of your parking and transportation needs at the University of Calgary.

Telephone: 403.220.6772

Email: parking@ucalgary.ca

Location: Olympic Volunteer Centre (OVC), 1833 Crowchild Trail N.W.

Website: ucalgary.ca/parking

Hours of operation: Monday to Friday: 7:30 a.m. to 5:00 p.m.

All Parking and Transportation Services proceeds stay on campus; supporting student programming, academic, and research initiatives.

Residence Services

Residence Services provides quality accommodations and programs, which enhance the student experience, support academic success and foster leadership development.

Student Housing

Residence buildings offer a variety of accommodation styles, including traditional dormitory (for first-year), studios, one-bedrooms, two bedrooms and four bedroom apartments, as well as two and three bedroom suite-style buildings. Housing options transition with students as they progress through their university experience. All buildings have an academic lounge where students can study or attend tutoring sessions and a recreational lounge to relax with friends.

Telephone: 403.220.3210

Email: residence@ucalgary.ca

Location: DC01, 124 University Gate N.W.

Website: ucalgary.ca/residence

Hours of operation: Monday to Friday 8:00 a.m. to 8:00 p.m., Saturday 10:00 a.m. to 3:00 p.m., Sundays and Holidays 10:00 a.m. to 3:00 p.m.

Student-Family Housing

Student-family housing consists of 250 townhouses, arranged in a garden court setting specially designed for students with families. In addition to the facilities offered, Residence Education Staff facilitate programs and services to meet family members' needs, including community barbecues, summer camps, ESL conversation groups, and the Jenna Chang Children's Resource Library.

Telephone: 403.220.7227

Email: family.housing@ucalgary.ca

Location: 3735 - 32 Avenue N.W.

Website: ucalgary.ca/residence

All Residence Services proceeds stay on campus; supporting student programming, academic, and research initiatives.

Student Legal Assistance (SLA)

Executive Director: Michelle Christopher

Student Legal Assistance (SLA) is the on-campus law clinic staffed by U of C law students who, with the assistance of volunteer advising lawyers, provide free representation and legal assistance to U of C students and needy Calgary and area residents who are unable to afford a lawyer. SLA provides services throughout the year in civil, criminal and family law matters, with evening clinics during the academic year and daytime clinics during the summer months.

Telephone: 403.220.6637

Location: 3390 Murray Fraser Hall

Website: slacalgary.ca/

The Students' Union

The SU advocates for students on the quality and affordability of their university education and provides a range of services and events. The SU manages MacHall and operates the Den, La Taqueria, Bound and Copied, Stör, and the conference centre and all proceeds are reinvested into programs that benefit students and the campus.

Telephone: 403.220.6551

Email: supres@ucalgary.ca

Location: Students' Union Office 251 MacEwan Student Centre

Website: su.ucalgary.ca

Study Abroad Office/ International Learning

Study Abroad Office/International Learning

Colleen Packer, Manager

Students are encouraged to include an "international experience" in their time at university. This may include Study Abroad in credit programs such as student exchange programs with partner universities; group study programs led by University of Calgary professors; term abroad programs; research projects; practica, internships and co-operative education abroad; independent study approved for a Letter of Permission. It may also include approved volunteering abroad or non-credit experience abroad.

Telephone: 403.220.5581

Fax: 403.289.4409

Email: study.abroad@ucalgary.ca

Location: MacEwan Student Centre, Room 275 (CISSA)

Website: ucalgary.ca/studyabroad/

Taylor Institute for Teaching and Learning

The Taylor Institute for Teaching and Learning—at once a building, a community, and a collection of activities—is dedicated to better understanding and improving student learning. The Institute gathers people from across campus to inspire and be inspired by new thought, conversation, practices and inquiry in teaching and learning.

Housed in a groundbreaking new building, the Taylor Institute is a hub for evidence-based approaches to teaching and learning in higher education. The institute brings together three fully integrated units: the Office of the Academic Director of the Taylor Institute; the Educational Development Unit; and the College of Discovery, Creativity and Innovation.

The Taylor Institute is a cornerstone of the University of Calgary's Eyes High vision and strategy that commits to enriching the quality and breadth of learning.

Telephone: 403.220.4949

Fax: 403.282.0730

Email: taylorinstitute@ucalgary.ca

Location: Taylor Institute for Teaching and Learning, 434 Collegiate Blvd.

Website: ucalgary.ca/taylorinstitute/

Unicard Office

The Unicard is a multi-purpose campus card for all students, staff and faculty, and is the official University of Calgary identification and access card. It can also be used to check out books at the library, to access the gym and athletic facilities and as a debit card for purchasing products and services on campus ranging from meals and Bookstore merchandise to printing and photocopying.

Telephone: 403.220.7290

Email: unicard@ucalgary.ca

Location: Dining Centre 018, 124 University Gate N.W.

Website: ucalgary.ca/unicard

Hours of operation: Monday to Friday: 8:30 a.m. to 4:30 p.m.

All Unicard proceeds stay on campus; supporting student programming, academic, and research initiatives.

University Child Care Centre Society (UCCC)

The University Child Care Centre Society currently has two locations at the U of C: one located on Main Campus between Scurfield Hall and the Biological Sciences Building and the other on West Campus, across from the Alberta Children's Hospital. Both of our centres are licensed, monitored and regulated by both Alberta Human Services Child development branch and Alberta Environmental Health.

Telephone: 403.220.3303

Email: waitlist@ucalgary.ca

Website: ucalgary.ca/uccc

Hours of Operation: 7:30 a.m. to 5:30 p.m., Monday through Friday.

University Theatre Services

University Theatre Services (UTS) is a support service department within the Faculty of Arts, with a primary function to support the academic programs of the departments in the Faculty. UTS also provides a wide variety of production, publicity, box-office and management support services to all users of the University Theatre, the Rozsa Centre including the Eckhardt-Gramatté Hall, the Boris Roubakine Recital Hall and the Reeve Theatre, including both on campus and off campus customers. The Rozsa Centre also provides complete facilities for small conferences and meetings.

For more information please visit our website at: scpa.ucalgary.ca/theatre-services/welcome-theatre-services.

Undergraduate Admissions

All enquiries relating to admission should be directed as follows:

Undergraduate Admissions
MacKimmie Block
2500 University Drive N.W.
Calgary, Alberta T2N 1N4
Telephone: 403.210.7625
Email: future.students@ucalgary.ca
Web: ucalgary.ca/prospectivestudents/

Cumming School of Medicine (Medical Doctor)
Room G740 - Health Sciences Centre
3330 Hospital Drive N.W.
Calgary, Alberta T2N 1N4
Telephone: 403.220.4262
Email: ucmedapp@ucalgary.ca

Environmental Design
2500 University Drive N.W.
Calgary, Alberta T2N 1N4
Telephone: 403.220.4388

Faculty of Graduate Studies
MacKimmie Tower, Room 213
2500 University Drive N.W.
Calgary, Alberta T2N 1N4
Telephone: 403.220.4938
Email: graduate@ucalgary.ca

Law Admissions
Murray Fraser Hall
2500 University Drive N.W.
Calgary, Alberta T2N 1N4
Telephone: 403.220.4155
Email: law@ucalgary.ca

Veterinary Medicine Admissions
TRW 2D01, 3280 Hospital Drive N.W.
Calgary, Alberta T2N 4Z6
Telephone: 403.220.8699
Email: vet.admissions@ucalgary.ca

The courses of study in the University of Calgary are, unless otherwise noted, are open to all qualified students. The University reserves the right to establish programs or pathways to support disadvantaged groups.

The language of instruction at the University of Calgary is English except in certain courses. As resources permit, selected courses in some disciplines may also be offered in other languages.

A.1 Classification of Students

A.1.1 Undergraduate Students

Undergraduate students are students who have fulfilled admission requirements and are registered in courses for credit towards an undergraduate degree, diploma or certificate. Visiting students, visiting student researchers and Open Studies students are considered undergraduate students.

Undergraduate students fall into two categories:

(a) Full-time students: Those students who are registered in the equivalent of nine or more units each term;

(b) Part-time students: Those students who are registered in less than nine units each term.

Undergraduate students, or students in programs identified with undergraduate faculties, are classified as follows:

1. Regular Student: A student who has been formally admitted to study in the University and is registered in a program leading to a degree, diploma or certificate (credit).

2. Open Studies Student: A student who is permitted to register in credit courses, but who is not admitted to a program leading to a degree, diploma or certificate (credit). For more information, refer to A.14 Admission to Open Studies.

3. Visiting Student/Visiting Student Researcher: A student who is permitted to register in credit-based courses who is registered at another recognized/accredited degree granting institution and has obtained a letter of permission to take courses at the University of Calgary toward their home institution credential or to complete research at the University of Calgary toward their home institution credential.

4. Exchange Student: A student who is permitted to register in credit courses at the University of Calgary as part of a formal exchange agreement.

A.1.2 Graduate Students

Graduate students are those students who are admitted to the Faculty of Graduate Studies to pursue a master's or doctoral degree, diploma or certificate, or are admitted as regular, interdisciplinary degree, Cotutelle, qualifying, conditional admission for language upgrading, visiting and exchange. Please refer to the Faculty of Graduate Studies section for further information.

A.2 Undergraduate Admission

Applicants must meet the minimum standards indicated in this Calendar. Applicants seeking admission to the Faculties of Environmental Design, Graduate Studies, Law, Cumming School of Medicine (MD program), and Veterinary Medicine are advised to contact these Faculties directly for admission procedures.

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All applicants must satisfy the undergraduate admission requirements and faculty specific admission requirements. Admission to all programs at the University of Calgary is competitive. The admission average required to secure an offer of admission will be determined once the qualifications of the applicant pool have been assessed for each faculty/program; therefore, meeting the minimum admission requirement does not guarantee admission. While every attempt will be made to accept all qualified applicants to the University of Calgary, enrolment will be limited to the number of students that can be accommodated by the resources available to maintain an acceptable quality of education.

1. **High School Admission Average**: will be calculated using the five approved courses required for admission by the selected faculty (see Section A.5 or visit ucalgary.ca/admissions). The University will determine the equivalent for applicants whose courses were completed outside of the Alberta secondary school system.

2. **Transfer Admission GPA**: will be calculated using the most recent course work to a maximum of 30 units (University of Calgary courses and/or transferable courses taken at other institutions), unless otherwise specified by the Faculty. Early conditional offers may be made using less than 30 units in

the admission GPA calculation. All courses attempted within a term will be included except where the number of courses taken within a term exceeds 30 units. Should this occur the highest grades will be used. In some faculties prerequisite courses will be included first. Grades in high school equivalent courses offered by post-secondary institutions will not be used in determining the Transfer Admission GPA.

The following chart details when the High School Average or Transfer Admission GPA will be used.

Student Status	High School Average	Transfer Admission GPA
Applicant has only completed high school courses	Considered	Not applicable
Fewer than 18 units completed	Considered	Not considered
18 or more units completed* (most programs)	Not considered however required high school courses (or equivalents) must be successfully completed	Considered

**Students who have completed a minimum of 12 units may be considered for conditional admission provided they are registered in, and complete, a minimum of six additional units. See section A.5.3 (Transferring from Another Post-secondary Institution) for additional details.*

Faculty Transfers (Change of Program): Students are permitted to transfer to another faculty provided space availability, they possess the minimum average established for admission to that faculty for Fall Term and present prerequisite courses. For more information refer to Academic Regulations, Section D. Change of Faculty or Program.

Supplementary Admission Requirements: Some faculties/programs consider other criteria in addition to the admission average. This may include an audition, portfolio or supplementary information form. The following faculties require additional criteria:

Faculty of Arts (Dance, Music, Visual Studies)

Haskayne School of Business (Petroleum Land Management and Energy Management concentrations)

Cumming School of Medicine (BCR, BHSc)

Schulich School of Engineering (Energy Engineering)

Faculty of Social Work

For additional details on supplementary application information visit ucalgary.ca/admissions/requirements.

A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts

	Application Deadline	Transcript/ Document Deadline
Fall **High School** **Early Admission** **Standard Admission**	December 15 March 1	January 15 March 31 August 1 – Final transcript due for all high school applicants
Transfer Students	March 1	June 1
Education After-Degree	March 1	March 15
International (Outside Canada)	March 1	March 31
Diverse Qualifications	March 1	March 31
Exchange/Visiting	June 1	
Open Studies	August 20	
Change of Program*	February 1	
Winter		
Nursing (Transfer & Degree-Holders)	September 1	September 30
Medicine (BCR)	October 15	September 30
Exchange/Visiting Open Studies	December 15	September 30
Change of Program*		
Nursing	September 1	
Most other programs	December 1	
Spring/Summer		
Energy Engineering	February 1	September 30
Education (Community-Based)	March 1	February 15
All Other Students Exchange, Visiting	March 1	March 31

**Detailed information for change of program can be found in Section D (Change of Faculty or Program).*

Detailed information on admission deadlines can be found at ucalgary.ca/admissions/dates.

Failure to submit transcripts by the deadlines will result in the cancellation of the applicant's Application for Admission. Applicants are encouraged to monitor their Student Centre in MyUofC (my.ucalgary.ca) to check the status of their application and documents received.

Students granted tentative admission on the basis of unofficial transcripts and for whom **official** transcripts have not been received by the deadline dates, will have a hold placed on their record that will restrict registration activity.

A.4 General Admission Procedures

Any student who wishes to become a registered student of the University must complete an Application for Admission, pay the application fee, submit required documentation to demonstrate they meet the admission requirements and receive a notice of acceptance and pay the required admissions confirmation deposit before they are permitted to register in courses.

The University of Calgary reserves the right, published requirements notwithstanding, to refuse applicants for admission or registration, even if they meet the entrance requirements, on the basis of their overall academic records or on the basis of grounds that, in the opinion of the University, are reasonable in the circumstances.

All students seeking admission to the University must ensure the information provided as part of their application for admission is true and accurate. Students who falsify or omit information as part of the admission process will have their admission and registration cancelled and may be identified to other post-secondary institutions. Falsified documents may be referred to the appropriate authorities for prosecution under the Criminal Code of Canada.

A.4.1 Application for Admission

An undergraduate Application for Admission must be completed by students who wish to be admitted to an undergraduate degree or diploma program. The University of Calgary participates in the Alberta Post-Secondary Application System. The Application for Admission is available online at ucalgary.ca/admissions/applynow.

International students can access the online application at ucalgary.ca/admissions/apply/international.

Students who wish to enter the Faculties of Law, Veterinary Medicine, Environmental Design, Graduate Studies can access the application at ucalgary.ca/admissions/applynow or from the specific faculty website.

Students wishing to enter the MD program in the Cumming School of Medicine should contact the School for the application form and admission information ucalgary.ca/mdprogram/admissions.

Students who wish to register as Visiting, Exchange or Open Studies students must complete the online application form available at ucalgary.ca/admissions/process/open.

Students who leave the University of Calgary to attend another postsecondary institution, must re-apply for admission and provide official transcripts from all postsecondary institutions attended. Please note that when an application is completed through the Alberta Post-Secondary Application System (APAS), students authorize the University of Calgary to request transcripts on their behalf from Alberta Education and other participating Alberta institutions, if applicable.

Students who have not attended the University of Calgary for two years or more (one year for the Faculty of Nursing and the Schulich School of Engineering) or who are applying to the Bachelor of Education Consecutive (After-Degree) program must re-apply for admission.

Any student who applied for admission to the University, but never attended, must complete a new Application for Admission and submit official transcripts. Previously submitted documents will be destroyed after a period of one year.

Students who have been suspended, expelled or required to withdraw from a faculty should refer Section A.6 Required to Withdraw Students for further information.

Incomplete applications or those submitted without the application fee will not be processed. Complete applications must be submitted to the Admissions Office prior to the application deadline to be considered. The University accepts no responsibility for denials of admission based on the failure of applicants who do not complete their application in a timely manner.

Future students should not wait until the results of test scores and/or final high school results are received before applying for admission.

A.4.2 Application Fee

Applicants submitting an Application for Admission to the University are required to pay a non-refundable $125.00 application fee ($145.00 for applicants presenting international credentials) by the application deadline. Applications received without the fee will not be considered for admission. Students who are required to re-apply for admission to the University of Calgary are required to pay this fee.

Students are encouraged to submit payments online. If paying by cheque or money order, please make payable to the University of Calgary.

The above fees are subject to change without advance notice.

A.4.3 Supporting Documents

Supporting documents, such as transcripts, must be received by the University by the deadlines indicated on the website: ucalgary.ca/admissions/dates. If official transcripts are not available by the deadlines, students may provide unofficial copies of high school and post-secondary records to be considered for tentative admission. They may be emailed as a PDF or TIFF file to transcripts@ucalgary.ca. Alternatively, they can be sent to us by transcript delivery systems such as Parchment or e-ScriptSafe.

Official transcripts are documents which are sent directly to the Admissions Office from the Department of Education and/or other institutions maintaining such records. Through APAS, applicants who have attended high school and/or another participating institution(s) in Alberta provide authorization to the University of Calgary to request transcripts on their behalf from Alberta Education and/or the institution. It is the applicant's responsibility to request out-of-province institutions to send complete official transcripts directly to the Admissions Office. See paragraph above for acceptable delivery formats.

International applicants seeking admission on the basis of documents which are in a language other than English must submit official documents in the original language as well as English translations prepared by a certified translator. Documents must indicate the courses studied and the grades obtained in each course.

Transcripts received by the Admissions Office become the property of the University of Calgary and will not be photocopied or returned to students or forwarded to other institutions.

Documents submitted, but not required for admission, will be destroyed. Students are advised to only submit documents requested by the University and required for admission consideration.

A.4.4 Admission Deposit

Students who are offered admission will be required to pay a one-time $500.00 admission deposit by the deadline indicated in their offer of admission to confirm their seat in their admitted program. The deposit is non-refundable and will be applied against tuition and fees. Re-admits are required to pay the admissions deposit.

A.4.5 Deferral of Admission

Requests for deferral of admission are available to students who are applying directly from high school and have not attended another postsecondary institution. Requests may be submitted after a student has been admitted and paid the $500.00 admission deposit. Deferral requests may be submitted in writing to the Associate Registrar, Recruitment and Admissions who will consult with the Faculty to which the student has been admitted. Deferrals are not guaranteed and will be considered on a case by case basis. Students who attend another postsecondary institution during the deferral period will have the deferral cancelled and must re-apply for admission.

Students admitted to the Cumming School of Medicine (MD program), Veterinary Medicine, and Law please see the Faculty website for admission deferral information.

A.5 Undergraduate Admission Requirements

Admission to an undergraduate program may be obtained under one of the following categories:

1. Canadian High School Admission
2. International High School Admission
3. Transferring from Another Postsecondary Institution
4. Adult Student Admission
5. Second Degree

All applicants must demonstrate English language proficiency (refer to A.11 English Language Proficiency).

A.5.1 Canadian High School Students

The general admission requirement to the University of Calgary is Alberta Grade 12 graduation, or equivalent. The admission average will be calculated using five approved courses required for admission.

The University reserves the right to require additional assessments in cases where questions exist concerning documentation.

A.5.1.1 Early Admission for Current High School Students

An early offer of admission may be granted to current high school students who present an average of 90 per cent or higher in 4 approved subjects completed in grade 11. The average will be calculated on grade 11 courses. If both grade 11 and grade 12 grades are available, the grade 12 grades will be used. Early Admission is only available to first choice programs.

Students admitted must maintain their academic standing, complete all grade 12 requirements for the program they have been admitted to and obtain their Alberta Grade 12 Graduation, or equivalent. A final transcript is required by August 1. For more information visit: ucalgary.ca/admissions/process/early.

Equivalent courses will be considered for students who completed courses outside the province of Alberta.

Faculty/ Program	Required Courses	Supplementary Requirements
Arts (BA, BSc, BCC, BCMS, BFS)	English Language Arts 20-1 Mathematics 20-1 or 20-2 Social Studies 20-1 One approved course	
Fine Art Programs: Visual Studies, Dance, Drama & Music	English Language Arts 20-1 Social Studies 20-1 Two approved courses	Visual Studies: portfolio BMus: complete online audition form and audition. Dance: audition and statement of interest required
Science	English Language Arts 20-1 Mathematics 20-1 Two of Biology 20, Chemistry 20, Physics 20	

Education (4 year Program – Community-Based)	English Language Arts 20-1 Language Arts: One of Science 20, Biology 20, Chemistry 20 and Physics 20. Two approved 20 level courses Mathematics and Science: Mathematics 20-1 Two of Biology 20, Chemistry 20, Physics 20 Social Studies: Social Studies 20-1 One of Science 20, Biology 20, Chemistry 20 and Physics 20 One 20 level approved courses	
Engineering	English Language Arts 20-1 Mathematics 20-1 Chemistry 20 Physics 20	
Kinesiology	English Language Arts 20-1 Mathematics 20-1 Biology 20 Chemistry 20	
Medicine		
BCR	English Language Arts 20-1 Biology 20 Two approved courses	
BHSc	English Language Arts 20-1 Mathematics 20-1 Biology 20 Chemistry 20	Online supplementary application
Nursing	English Language Arts 20-1 Mathematics 20-1 or 20-2 Biology 20 Chemistry 20	
Business	English Language Arts 20-1 Mathematics 20-1 Social Studies 20-1 One approved course	

Approved Courses

The following is a list of approved Alberta high school courses. Further details and information regarding equivalent courses for other Canadian provinces and territories are available at ucalgary.ca/admissions/requirements.

- Aboriginal Studies 20 (5 credits)
- Any International Baccalaureate (IB) or Advanced Placement (AP) course
- Biology 20
- Chemistry 20
- Computing Science, Intermediate Level (5 credits) or Advanced Level (5 credits) Career and Technology Series
- Fine Arts Courses - For admission to non-Fine Arts programs, only one Art, Music or Drama course may be used: Art 20 or 21, Choral Music 20, General Music 20, Instrumental Music 20, Drama 20, Dance 25
- Language or Language and Culture Courses at the 20 level
- Mathematics 20-1
- Mathematics 20-2
- Physical Education 20
- Physics 20
- Science 20
- Social Studies 20-1

Any two of the following 3 or 4 credit courses combined to fulfil one approved course:

- Political Thinking 20
- Comparative Government 20
- Religious Ethics 20
- Religious Meanings 20
- Local and Canadian Geography 20
- Personal Psychology 20
- General Psychology 20
- General Sociology 20
- Sociological Institutions 20
- Origins of Western Philosophy 20
- Contemporary Western Philosophy 20
- Western Canadian History 20
- Canadian History 20
- Economics for Consumers 20

A.5.1.2 Standard Admission For High School Students

Standard admission is based on five approved courses required for admission to a program. Admission is competitive and meeting the minimum requirement does not guarantee admission. Students presenting an Approved Option as their fifth course must obtain a minimum 65 per cent average on the remaining four courses in addition to meeting the program specific competitive admission average. For students attending schools operating on non-semester system (linear), admission will be based on mid-year (mid-term) grades.

Students must submit their application for admission by March 1 and an interim transcript by March 31 that shows final grades to date and current course registrations. For More information visit: ucalgary.ca/admissions/requirements.

Standard Admission Requirements

The admission average will be calculated using five courses including final grade 11 grades and at least two grade 12 academic courses required for admission. If both grade 11 and 12 grades are provided the grade 12 grade will be used.

Students who wish to start in the Fall term and complete required courses during the summer prior to admission may not normally be considered for admission.

Equivalent courses will be considered for students who have completed studies outside the province of Alberta.

See the "**Standard Admission Requirements Chart for High School Students**".

Approved Courses

The following is a list of approved Alberta high school courses. Further details and information regarding equivalent courses for other Canadian provinces and territories are available at ucalgary.ca/admissions/requirements.

- Aboriginal Studies 20 or 30 (5 credits)
- Any International Baccalaureate (IB) or Advanced Placement (AP) courses
- Biology 20 or 30
- Chemistry 20 or 30
- Computing Science, Intermediate Level (5 credits) or Advanced Level (5 credits) Career and Technology Series
- Fine Arts courses*- For admission to non-Fine Arts programs, only one Art, Music or Drama course may be used: Art 20 or 30 or 21 or 31, Choral Music 20 or 30, General Music 20 or 30, Instrumental Music 20 or 30, Drama 20 or 30, Dance 25 or 35
- Language or Language and Culture Courses at the 20 or 30 level
- Mathematics 20-1 or 30-1
- Mathematics 20-2 or 30-2
- Mathematics 31
- Physics 20 or 30
- Science 20 or 30
- Social Studies 20-1 or 30-1

Notes:

- Two courses in the same subject area may not be presented to satisfy entrance requirements unless the courses are Mathematics 30-1 or Mathematics 30-2 and Mathematics 31.
- Only one Grade 12 level course in a language stream may be used to satisfy admission requirements.
- A minimum grade of 70 per cent in Alberta Mathematics 30-1 is the prerequisite for first year math courses.
- Alberta Science 30 cannot substitute in for specific grade 12 science courses required for admission (Chemistry, Biology, Physics).

Approved Options

- Other five-credit 20- or 30-level courses excluding Special Projects 30 and English 30-2.
- Three-credit courses: two three-credit 20- or 30-level courses can be combined to fulfil ONE requirement. Courses at the 20 level and 30 level CANNOT be combined to satisfy a course requirement.
- One-credit courses: five intermediate or five advanced credits in Career and Technology Studies (CTS) can be used to fulfil ONE requirement. Intermediate and Advanced Credits cannot be combined to satisfy a course requirement.

Conditions of Admission

Standard Admission offers are conditional upon receipt of final transcripts. Students must maintain their academic standing, complete all grade 12 course requirements and obtain their Alberta Grade 12 Graduation, or equivalent. Students who fail to meet this requirement or do not provide final

Standard Admission Requirements Chart for High School Students

Faculty/Program	Required Courses	Supplementary Requirements	Notes
Arts			
BA, BSc, BCC, BCMS, BFS	English Language Arts 20-1 OR 30-1 Four approved courses at the 20 or 30 level of which one may be an approved option		Some programs have first year courses with specific prerequisites. While not required for admission, the following are recommended: Math 30-1 : Earth Science, Economics, Geography and Psychology Biology & Chemistry 30 : Earth Science and Psychology
Fine Art Programs: Visual Studies, Dance, Drama & Music	English Language Arts 20-1 OR 30-1 Four approved courses at the 20 or 30 level* *Approved courses may include locally developed courses specific to Art, Dance, Drama or Music. A maximum of two Approved Fine Arts Courses are permitted. Either two Fine Arts Options, or one Fine Arts Option and one 3 or 5 credit option may be used.	Visual Studies : portfolio required BMus : complete online audition form and audition. Dance : audition and statement of interest required	Admission to the BMus, BA (Music) or Minor in Music programs requires evidence of successful completion of Advanced Rudiments or the departmental music theory diagnostic exam.
Education			
4 Year Program (Community-Based)	English Language Arts 20-1 OR 30-1 AND Language Arts : One of Science 20 or 30, Biology 20 or 30, Chemistry 20 or 30, Physics 20 or 30, three approved courses at the 20 or 30 level of which one may be an approved option Mathematics and Science : Mathematics 20-1 OR 30-1, and two of Biology 20 or 30, Chemistry 20 or 30, Physics 20 or 30, Mathematics 31 or CTS Computer Science Advanced (5 credits), and one approved option at the 20 or 30 level Social Studies : Social Studies 20-1 or 30-1, and one of Science 20 or 30, Biology 20 or 30, Chemistry 20 or 30, Physics 20 or 30 and two approved courses at the 20 or 30 level of which one may be an option Must meet course requirements for faculty offering the concurrent degree.		Preference for admission will be given to students from rural communities.
Concurrent Program	Must meet course requirements for faculty offering the concurrent degree.		
Science	English Language Arts 20-1 OR 30-1 Mathematics 20-1 OR 30-1 Two of Biology, Chemistry or Physics at the 20 or 30 level*, Mathematics 31, CTS Computer Science Advanced One approved course or option at the 20 or 30 level		Although courses may not be required for admission, they may be prerequisites for first year courses. Students are encouraged to take high school courses related to their intended major.
Engineering	English Language Arts 20-1 OR 30-1 Mathematics 20-1 OR 30-1 Mathematics 31 Chemistry 20 OR 30 Physics 20 OR 30	Energy Engineering: Supplementary Application required	Students who do not present Math 31 please see section 3.1 in the Schulich School of Engineering section.
Kinesiology			
Most programs	English Language Arts 20-1 OR 30-1 Mathematics 20-1 OR 30-1 Biology 20 or 30 Chemistry 20 or 30 One approved course or option at the 20 or 30 level		

(Continued on next page...)

official transcripts by August 1 will have their admission and registration cancelled.

Applicants who meet admission requirements with final grades will only be considered for admission upon receipt of an official final transcript and if space is still available at that time.

Alternate Admission Offers

Applicants will be considered for their first and second choice programs in order of choice. Applicants who are not granted admission to their first or second choice programs may be waitlisted and/or offered admission to an alternate program.

A.5.2 International High School Admissions

The United States and Countries Offering American-Based Curricula

Applicants completing an American-based high school curriculum may be considered for admission based on an evaluation including a standard college entrance exams (SAT or ACT) and overall high school GPA. Applicants following an American based curriculum in countries outside the United States (and US territories) may be exempted from providing the SAT or ACT test scores.

Applicants who have attended a university/college may not submit SAT or ACT tests in order to gain admission to the University of Calgary.

College Entrance Examination

Applicants who are completing or have completed their twelfth year of education at an American high school may qualify for admission by obtaining acceptable scores on the SAT Reasoning Test or ACT Test, three appropriate SAT Subject Tests and proof of a high school diploma. A conditional offer of admission may be granted on the basis of these scores. If presenting the SAT Reasoning Test, a minimum score of 1650 (with no mark below 550) must be presented in each of Critical Reading, Mathematics and Writing components. If presenting the ACT Test, a minimum composite score of 24 is required. Admission is competitive, therefore, meeting the minimum score does not guarantee admission.

Applicants may also qualify for admission by presenting acceptable scores on the SAT Reasoning Test or ACT Test and a high school transcript for assessment of specific high school courses which may be acceptable equivalents to prescribed SAT Subject Tests. Applicants should note that admission is on a competitive basis with consideration of both SAT/ACT scores and high school achievement.

All test scores and an official high school transcript showing that the high school diploma has been conferred must be received by August 1. Students who fail to meet this requirement or do not provide final official transcripts by August 1 will have their admission and registration cancelled.

Notes:

1. In order to be considered for admission to the University under the College Entrance

(Continued from previous page...)			
Biomechanics	English Language Arts 20-1 OR 30-1 Mathematics 20-1 OR 30-1* Biology 20 or 30 Chemistry 20 or 30 Mathematics 31^		*A grade of 70% in Math 20-1 or 30-1 is required. ^If Mathematics 31 is not available the admission average will be based on four courses. Although not required for admission, Physics 30 is strongly recommended as it is a prerequisite for some courses.
Medicine			
BCR	English Language Arts 20-1 OR 30-1 Biology 20 OR 30 Three approved courses at the 20 OR 30 level of which one may be approved option		
BHSc	English Language Arts 20-1 OR 30-1 Mathematics 20-1 OR 30-1* Biology 20 OR 30 Chemistry 20 OR 30 One approved course or option at the 20 OR 30 level	Online supplementary application	*A grade of 70% in Math 20-1 or 30-1 is required
Nursing	English Language Arts 20-1 OR 30-1 Mathematics 20-1 or 20-2 OR 30-1 or 30-2 Biology 20 or 30 Chemistry 20 or 30 One approved course or option at the 20 or 30 level		Math 30-2 is preferred for admission to Nursing
Business	English Language Arts 20-1 OR 30-1 Mathematics 20-1 OR 30-1 Three approved courses at the 20 or 30 level one of which may be an approved option		
Social Work	Students must complete two years (60 units of courses) including Social Work 201 OR the Alberta Social Work Diploma to be considered for admission	Students must also submit the Social Work Supplementary Application Form, a resume, references and essay	

Examinations category applicants must have completed the required tests prior to undertaking university/college studies.

2. Only one of SAT Math Level 1 or Math Level 2 may be presented for admission.

3. Applicants whose schooling has been completed in countries other than the United States, with the exception of those applicants who are completing their twelfth year of schooling at an American high school outside of the Unites States, are not eligible for entrance under the College Entrance Examinations category.

4. Application information for the tests may be obtained from:

SAT: collegeboard.com/

ACT: actstudent.org/

Either the SAT Reasoning Test or ACT Test is required for admission to all programs.

The SAT test equivalents by faculty are:

Faculty of Arts	SAT Reasoning Test (or ACT) Literature Two additional Subject Tests
Haskayne School of Business	SAT Reasoning Test (or ACT) Math Level 1 or 2 Literature One additional Subject Test
Faculty of Kinesiology	SAT Reasoning Test (or ACT) Math Level 1 or 2 Biology (Ecological or Molecular) Chemistry Note: Physics is recommended for Biomechanics majors
Nursing	SAT Reasoning Test (or ACT) Math Level 1 Biology (Ecological or Molecular) Chemistry
Cumming School of Medicine	BCR SAT Reasoning Test (or ACT) Literature Biology (Ecological or Molecular) One additional Subject Test BHSc SAT Reasoning Test (or ACT) Math Level 1 or 2 Biology (Ecological or Molecular) Chemistry
Schulich School of Engineering	SAT Reasoning Test (or ACT) Math Level 2 Chemistry Physics
Faculty of Science	SAT Reasoning Test (or ACT) Math Level 1 or 2 Two Subject Tests from Biology (Ecological or Molecular), Chemistry or Physics
Werklund School of Education (4 Year Bachelor of Education – Community-Based)	SAT Reasoning Test (or ACT) Language Arts: Literature One Subject Test from Biology (Ecological or Molecular), Chemistry or Physics One additional Subject Test Mathematics and Science: Math Level 1 or 2 Two Subject Tests from Biology (Ecological or Molecular), Chemistry or Physics Social Studies: Literature One Subject Test from Biology (Ecological or Molecular), Chemistry or Physics History

Note: Specific SAT subject tests may be accepted as equivalent to prescribed high school courses.

Countries Offering the British Education System

General Certificate of Education (GCE)/ General Certificate of Secondary Education (GCSE)

Students who present the GCE or GCSE will be considered using five academic courses as detailed in A.5.1.2 Standard High School Admission Requirements. Applicants can be considered with two courses at Advanced Level (A) and three GCSE/Ordinary Level, or four courses at Advanced Subsidiary Level (AS) and one at the “GCSE” Level. Grades of D and E are not acceptable, nor are scores of 7, 8 and 9 on School Certificates.

The University of Calgary awards advanced credit for specific “A” level courses when a grade of C or better is achieved. Students should refer to Section A.12 Transfer Credit/ Advanced Standing for details.

Other Countries

Applicants educated in other countries may be considered for admission on their academic merits. Those completing Canadian high school courses will always have the grades obtained in these courses used in lieu of equivalents obtained on international certificates. Detailed information is available at: ucalgary.ca/admissions/process/international.

International students seeking admission on the basis of documents not listed on the Admissions website should submit certificates indicating the courses studied and the grades achieved to the Admissions Office. When these certificates are in a language other than English, English translations (prepared by a certified translator) must accompany the original documents.

Conditions of Admission

Students who are currently completing course work must meet the conditions of their admission by August 1. Conditions are removed upon receipt of final official transcripts confirming that course requirements and admission average have been met. Students who fail to meet this requirement or do not provide final official transcripts by August 1 will have their admission and registration cancelled.

International students who are not currently attending an institution are considered for regular admission when their application, all required transcripts and documentation are received. Applications with all supporting documents received by March 31 will be considered. Those with supporting documents received after March 31 will be considered as space permits.

A.5.2.1 International Baccalaureate (IB)

Applicants who have completed the International Baccalaureate diploma can be considered for admission on the basis of their diploma score. Students must meet the score and specific course requirements for the program to which they have applied.

For applicants who complete both the International Baccalaureate diploma and senior matriculation/secondary school graduation, admission will be based on that credential which is to the advantage of the student.

The University of Calgary awards up to 30 units (one year) for the completed International Baccalaureate diploma. Specific course credit for Higher Level courses is awarded as set out in Section A.12 Transfer Credit/Advanced Standing.

Students awarded the full year of credit for a completed International Baccalaureate diploma remain eligible for all admission categories and University awards normally open to entering first-year students.

Conditions of Admission

Students admitted on the basis of predicted IB results which include the anticipated grades in both individual courses, including those required for the specific program and additional points for essay and Theory of Knowledge, must meet the conditions of their admission by August 1. Conditions are removed upon receipt of the final official transcripts confirming that course requirements have been met. Students who fail to meet this requirement or do not provide final official transcripts by August 1 will have their admission and registration cancelled.

A.5.3 Transferring from Another Postsecondary Institution

Applicants who have attended an accredited/recognized post-secondary institution may be considered for admission on the basis of their postsecondary academic standing. Some programs may require applicants to complete, or be in the process of completing, specific course requirements at the high school or post-secondary level.

To be considered a post-secondary transfer, students must have completed, or be in the process of completing a minimum of 18 units from a recognized/accredited institution (some programs may require more units). The minimum admission GPA requirement is 2.00; however, admission is competitive and meeting the minimum admission GPA requirement does not guarantee admission.

Students who present final grades in fewer than 18 units may be considered for conditional admission and will have their admission GPA calculated on a minimum of 12 units (some faculties may require a minimum of 30 units). See Section A.2 (Undergraduate Admission) for details on unit/credit requirements and how the transfer admission GPA will be determined. Students are not permitted to register in a University of Calgary degree or diploma program while simultaneously working towards a degree or diploma at another institution, unless a formal partnership exists between institutions. Students who wish to attend the University of Calgary as a visiting student (letter of permission) please see Section A.14 (Admission to Open Studies).

Conditional admission will be subject to verification of official transcripts showing final grades. If admission requirements are not met or if official transcripts are not received by June 1, admission and registration will be cancelled.

Applications and supporting documents received by March 31 will be automatically considered for conditional admission.

Please refer to section A.12 (Transfer Credit/ Advanced Standing) for information on the transfer of credits.

A.5.4 Adult Student Admission

Applicants who are 21 years of age or older by the first day of classes who are unable to present the five high school courses or at least 12 post-secondary units required for admission, are automatically considered for admission as an Adult Student. To be considered under the category, applicants must be Canadian citizens or Permanent Residents.

Adult Students must present English Language Arts 30-1 or an acceptable equivalent. Additional grade 12 level high school courses, or equivalent, are normally required by the faculty to which the student is seeking admission. In addition, the University's requirements for English language proficiency apply to Adult Students (see A.11 English Language Proficiency).

Official Transcripts: Applicants must provide official transcripts for all high schools and post-secondary institutions attended.

University of Calgary Continuing Education Courses: Students completing level II courses (English, Mathematics, Biology, Chemistry or Physics) through Continuing Education will have their results automatically forwarded to the Admissions Office. Applicants must indicate the courses taken and the expected date of completion on the Application for Admission.

Admission Requirements

Faculty	Courses Included in Admission Average
Arts	English Language Arts 30-1
Haskayne School of Business	English Language Arts 30-1 Mathematics 30-1
Cumming School of Medicine - BCR	English Language Arts 30-1 Biology 30
Cumming School of Medicine – BHSc Kinesiology Nursing	English Language Arts 30-1 Mathematics 30-1* Biology 30 Chemistry 30 *Kinesiology will also accept Math 31 Nursing will also accept Math 30-2
Schulich School of Engineering	English Language Arts 30-1 Mathematics 30-1 Physics 30 Chemistry 30 Mathematics 31 (Applicants without Math 31 or equivalent may be considered with a higher average).
Science	English Language Arts 30-1 Mathematics 30-1 Two of Biology 30, Chemistry 30, Physics 30, Mathematics 31, CTS Computer Science Advanced 5 Credits
Werklund School of Education (Concurrent Program)	Requirements depend on co-operating Faculty – See Arts, Kinesiology or Science

Applicants who have completed high school courses required for admissions more than ten years ago, may not have adequate prerequisites for certain courses. Applicants should contact the faculty to which they are seeking admission for additional information.

A.5.5 Second-Degree Students

Students who hold a three- or four-year bachelor's degree (or equivalent) from a recognized/accredited institution may pursue a program leading to a second or subsequent bachelor's degree (commonly referred to as an After-Degree), provided they qualifies for admission and meets all University and Faculty regulations. Consultation with academic advisors regarding admission and graduation requirements is necessary. The following regulations apply:

1. Applicants will not be considered for admission to a second or subsequent degree program in any major field, or equivalent, in which they already possess a degree or in a field that is deemed, by the University of Calgary, to be similar or equivalent to a degree already attained (e.g. applicants with a prior Bachelor of Business Administration will not be admitted to a Bachelor of Commerce).
2. Applicants holding a minor or equivalent will only be admitted to a second degree in the same area of the minor at the discretion of the University.
3. Normally, a minimum of 60 units (10.0 full-course equivalents) must be taken from the University of Calgary. These 60 units (10.0 full-course equivalents) are in addition to any courses used to satisfy requirements for the previous credential(s).
4. Prerequisites may be waived or advanced standing granted at the discretion of the admitting Faculty.
5. A student admitted to a second or subsequent degree program must satisfy all corresponding degree and major

field requirements current at the time of admission into the program.

6. Combined degrees are not available for second or subsequent baccalaureate degrees.

A.6 Required to Withdraw Students

Students who have been required to withdraw for academic reasons from any faculty at the University of Calgary or another post-secondary institution will not be permitted to register at the University until at least twelve months have elapsed since the student was required to withdraw. To qualify for admission, students are required to submit an application for admission and meet competitive admission criteria as outlined in A.2 Undergraduate Admissions, with the following exemptions:

1. Students required to withdraw for academic reasons other than a low grade point average, may be eligible for consideration of admission by another faculty provided they maintained a 2.00 or higher grade point average since their last review.
2. Students required to obtain a grade point average (GPA) above 2.00 for continuation in a program may be eligible for consideration of admission by another faculty provided they maintained at least a 2.00 grade point average since their last review.
3. Under exceptional circumstances, a University of Calgary student required to withdraw for academic reasons can be granted special permission by the appropriate Associate Dean of the faculty for immediate admission to the Fall Term. An Associate Dean can place restrictions on course registration and require a specific level of performance. Registration as an Open Studies student is not permitted.

Students seeking admission or re-admission after having been required to withdraw for academic reasons may submit a letter which: offers an explanation for their previously poor record; outlines their academic plans; and explains why they are now likely to be successful. This letter is mandatory for applicants to the Haskayne School of Business, the Faculty of Nursing and the Werklund School of Education. Admission is not automatic and will be considered on an individual basis.

Students who are granted admission or re-admission after having been required to withdraw will be admitted or re-admitted on probation.

Students who have twice been required to withdraw from one or more faculties at this or any other institution will not normally be considered for admission at any time.

Applicants seeking admission who have been involved in academic/non-academic misconduct at the University of Calgary or another institution which resulted in a suspension will only be considered for admission once the suspension period or one year has elapsed, whichever comes first. In all cases of academic/non-academic misconduct, admission or re-admission to the University of Calgary is at the discretion of the faculty to which the applicant is seeking entrance. A student expelled from a faculty will not be considered for re-admission to the same faculty.

A.7 Home-Schooled Applicants

Home-schooled applicants can qualify for admission by presenting provincial (diploma) examination results in appropriate courses (where applicable) or by satisfying the requirements given under College Entrance Examinations. Applicants must normally possess a high school diploma and present acceptable scores and an admission average on the five appropriate SAT tests.

A.8 Aboriginal Admissions Process

The University of Calgary acknowledges and respects the rich diversity of our learners, their communities, cultures and traditions, and their aspirations and abilities. In order to ensure equitable access and successful participation of Aboriginal learners, the University of Calgary has instituted an Aboriginal Admissions Process for qualified Aboriginal applicants seeking admission to most undergraduate programs.

For further information about the Aboriginal Admissions, refer to ucalgary.ca/admissions/process/aboriginal.

A.8.1 Aboriginal Student Access Program (ASAP)

The Aboriginal Student Access Program (ASAP) is a transition year access program for Aboriginal students in a supportive learning environment. The program offers advising and includes cultural, peer and tutorial support. ASAP provides an alternate access route for Aboriginal students moving from high school or upgrading programs to post-secondary degree programs. The program is designed to give students the foundations they need, as well as assisting in the selection of relevant post-secondary option courses for each student's target program. This admission pathway is available to students who may not meet standard admission requirements or are seeking additional support during their transition year.

ASAP provides enhanced academic support, including a designated advisor and one-on-one academic advising, cultural workshops, leadership training, peer support and tutorials. The program works closely with the Student Success Centre to provide a breadth of academic support services. Upgrading courses may be taken through Continuing Education at the University of Calgary (or other adult learning institutions) in conjunction with University of Calgary ASAP courses. Students who take a minimum of nine units are considered full-time students and may qualify for student loans, as well as other sources of funding.

Admissions Requirements

ASAP is for students of Aboriginal identity (First Nations, Métis and Inuit). Applicants must meet the general admission requirements for Open Studies, as defined in the University of Calgary Calendar. In addition, an advising interview will be conducted to determine the applicant's academic goals, discuss post-secondary sponsorship availability, course options, and available support services. The application deadline for the ASAP is determined by the application deadline specified for Open Studies.

Upgrading Courses

Upgrading courses may be taken through Continuing Education at the University of Calgary (or other adult learning institutions) in conjunction with University of Calgary courses.

For more information, contact 403.220.5975 or email ASAP@ucalgary.ca.

A.9 Diverse Qualifications Admission Process

The University of Calgary seeks first and foremost to attract excellent academic students. However, the University also recognizes that those who have achieved excellence outside academics or who have overcome significant hardships can make positive contributions to the University community. Recognizing that excellence means more than academic excellence, the University of Calgary may admit up to one per cent of new undergraduate students annually under this category.

To be eligible to apply under the Diverse Qualifications Admission Process, students must demonstrate:

- Excellence in non-academic areas
- High potential in academic/research activities
- Perseverance under great difficulty or hardship

In addition, students must:

- Meet the minimum admission requirements as specified in section A.2 of the Calendar
- Meet the University's English Language Proficiency requirement
- Be either a citizen or permanent resident of Canada
- Indicate their desire to be considered under this category on the Application for Admission
- Provide contact information for two references
- Complete a personal profile outlining circumstances, personal achievements and educational goals
- Provide official transcripts from all high school and post-secondary institutions attended

For further information about the Diverse Qualifications Admission Process and application deadlines, visit ucalgary.ca/admissions/process/diverse.

A.10 Combined or Concurrent Degree Admissions

Admission will only be considered for combined or concurrent degrees outlined in the Faculty sections of this Calendar. Students wishing to enter such combined or concurrent degrees must carefully read descriptions to determine when admission to such degrees may be obtained.

A.11 English Language Proficiency

English is the official language of instruction at the University of Calgary. All applicants must demonstrate English language proficiency to be considered for admission to an undergraduate program. English language proficiency is achieved by meeting one of the following criteria:

1. Successful completion of at least three years of formal, full-time study in English at a secondary school that meets one of the following requirements:
   a. Is in an exempt country; OR
   b. Is accredited to offer Canadian, American or British curricula; OR
2. Successful completion of at least two years of formal, full-time study in English at an accredited or recognized post-secondary institution in Canada or a University of Calgary approved English-speaking country (see Exempt Countries below); OR
3. Achieved a final grade of 80 per cent or better on the Alberta English Language Arts 30-1 (or equivalent); OR
4. Achieved a grade of 5 or better on the International Baccalaureate (IB) Higher or Standard Level English A (Literature or Language and Literature) examination or a grade of 6 or better on the Higher Level English B examination; OR
5. Achieved a grade of 4 or better on the Advanced Placement (AP) English Literature and Composition or English Language and Composition examination; OR
6. Achieved a grade of "A" or "B" in GCSE-level, A/S-level or A-level English (non-ESL) in the General Certificate of Education (GCE)/General Certificate of Secondary Education (GCSE) curriculum; OR
7. Successful completion of at least three years at a school in English that is an accredited member of the Council of International Schools (CIS), including completion of a senior academic English course (Alberta 30-1 level or equivalent); OR
8. Successful completion of a University of Calgary English credit course, comparative literature course, or university equivalent with a final grade of "B-" or better; OR
9. Successful completion of an approved English language test as follows:

See the "**English Language Proficiency Chart**".

Normally, students will only be admissible if the English Language Proficiency requirement have been satisfied. The Registrar has the authority to use discretion in exceptional circumstances. Students must meet English language proficiency requirements in addition to meeting the English subject admission requirement for the program to which they are applying.

English Language Proficiency Chart

Acceptable English Language Tests	Education	Nursing	All Other Undergraduate Programs
TOEFL iBT	100 with a minimum of 27 in each sub-score	92 with a minimum of 23 in each sub-score	86
TOEFL PBT	N/A	N/A	560
IETLS Academic	8.0 with no bands below a 7.0	7.0 with no bands below a 7.0	6.5
CAEL	N/A	N/A	70
MELAB	Overall score of 92 with a minimum score of 4- (4 minus) on the Speaking Test	Overall score of 90 with a minimum score of 3+ (3 plus) on the Speaking Test	85
PTE	70 (see note)	64 (see note)	60
Cambridge English Language Assessment: Cambridge English: Advanced (CAE)	200	185	180
Cambridge English Language Assessment: Cambridge English Proficiency (CPE)	200	185	180
University of Calgary International Foundation Program	Successful completion of Tier 3 courses with a minimum grade of "B" in each of IPFX 290, 293 and 297. Applicants must also present an additional speaking test (see Note 1).	Successful completion of Tier 3 courses with a minimum grade of "B" in each of IPFX 290, 293 and 297. Applicants must also present an additional speaking test (see Note 1).	Successful completion of Tier 3

Note: Applicants must also present one of the following in order to satisfy the spoken English requirement:
Nursing: Minimum score of 23 on the speaking component of the TOEFL iBT or 3+ on the MELAB Speaking Test.
Education: Minimum score of 27 on speaking component of the TOEFL iBT or a 4- on the MELAB Speaking Test.
Applicants to the Faculties of Law, Graduate Studies, Cumming School of Medicine (excluding applicants to the Bachelor of Health Sciences and Bachelor of Community Rehabilitation) or Veterinary Medicine should check English Language Proficiency requirements directly with those faculties.

A.12 Transfer Credit/ Advanced Standing

The University of Calgary will consider university-level course work completed at a recognized/accredited post-secondary institution (or equivalent) for credit toward a University of Calgary credential.

Students wishing to transfer should refer to the Alberta Transfer Guide which lists all course and program transfer agreements between post-secondary institutions in Alberta, Northwest Territories and Nunavut. The guide and other transfer information are available online at transferalberta.ca or by contacting: Alberta Council on Admissions and Transfer, Telephone: 780-422-9021 or 1-800-310-0000 (toll free). Email: acat@gov.ab.ca.

Students from other universities or colleges may be admitted with transfer credit to undergraduate programs. The amount of credit granted is determined by faculty regulations.

Students transferring from other institutions must make themselves aware of the prerequisites for courses they wish to take. This may be done by consulting the Courses of Instruction section of this Calendar. Students receiving specified transfer credit status for particular courses should be aware that this does not necessarily imply that exact course equivalence is being awarded; it may indicate an equivalent level of experience in a particular subject area.

Students transferring to the University of Calgary who have attended publicly supported post-secondary institutions in Alberta shall be subject to the same regulations as those transferring from one faculty to another within the University. The University of Calgary honours all transfer credit agreements as listed in the Alberta Transfer Guide and follows the CARI transfer statement:

The Province of Alberta recognizes four Comprehensive Academic and Research Institutions (CARI) within the Campus Alberta system: Athabasca University, the University of Calgary, the University of Lethbridge, and the University of Alberta. Alberta's CARIs are committed to the advancement of Campus Alberta goals, including enhanced learner movement within the advanced education system. To facilitate mobility, the four CARIs accept each other's credit courses for transfer. Minimum grade and program requirements determine the applicability of specific courses to a student's program.

Students who have taken the equivalent of university courses in some other manner may be given advanced placement (i.e., excused from taking such courses) but will not be granted advanced credit. In these cases, students will be required to substitute courses to complete program requirements.

The University reserves the right to require applicants for advanced credit or advanced placement to write examinations at any level including that of matriculation standing.

A.12.1 International Baccalaureate (IB) Program

The University of Calgary awards up to a full year of credit (30 units) for the completed International Baccalaureate diploma. Specific advanced standing or placement for Higher Level courses are awarded provided a minimum grade of "5" or higher is achieved. The balance of credit (including credit for Higher Level courses with grades below "5") required to bring the total to 30 units will be at the junior unassigned option level. In the case of advanced credit, a grade of "CR" will be recorded on the student's record.

Applicants who have not completed the diploma will receive advanced standing or placement as set out below for each Higher Level course completed with a grade of "5" or above. Junior unassigned option credit beyond that set out below is not available to students who do not complete the full IB diploma. Official IB transcripts are required as part of the evaluation process.

Students awarded advanced credit or advanced placement for IB courses should consult their faculty regarding course selection. Note that if advanced credit is awarded for a 200-level course that is a prerequisite for a 300-level course, students will be permitted to enter the 300-level course in first year.

Higher level IB courses approved for advanced credit or advanced placement are:

IB Subject	University of Calgary Equivalent
Anthropology	Anthropology 203
Biology	Biology 243
Chemistry	Chemistry 201/203 or 209 (Engineering only)
Computer Science	Computer Science 231 and 3 units (0.5 full-course equivalent) junior Computer Science*† or Engineering 233 (Engineering only)
Economics	Economics 201/203
English A (Literature or Language and Literature)	3 units (0.5 full-course equivalent) junior English†
French A1 or A Literature	French 315
French A2 or A Language/Literature	French 227
French B	French 213
Geography	Geography 205 and 3 units (0.5 full-course equivalent) junior Geography†
German A1 or A Literature	German 333
German A2 or A Language/Literature	German 331
German B	German 204
History	6 units (1.0 full-course equivalent) junior History†
Italian A1 or A Literature	Italian 303
Italian A2 or A Language/Literature	Italian 301
Italian B	Italian 203
Latin	Latin 301/303
Mathematics	Mathematics 249
Mathematics (Further)	Mathematics 265 or 275 (Engineering only)
Music	Advanced Placement (Based on audition/placement tests, students may be given advanced placement and permitted to take selected Music courses by "Special Assessment.")
Philosophy	3 units (0.5 full-course equivalent) junior Philosophy†
Physics	Physics 221/223
Psychology	Psychology 200
Russian A1 or A Literature	Russian 303
Russian A2 or A Language/Literature	Russian 301
Russian B	Russian 209
Spanish A1 or A Literature	Spanish 303
Spanish A2 or A Language/Literature	Spanish 301
Spanish A or B	Spanish 203
Visual Art	Art 231/233

**Students who successfully complete a challenge examination may receive credit for Computer Science 233 in lieu of the junior Computer Science.*

† "Junior" refers to credit at the 200 level, but for which no direct University of Calgary equivalency exists.

A.12.2 Advanced Placement (AP) Program

AP students automatically receive advanced credit or advanced placement in approved courses where they present grades of 4 or higher. In the case of advanced credit, a grade of "CR" will be recorded on the student's record. Official AP transcripts are required as part of the evaluation process.

AP course	University of Calgary Equivalent
Art History	Art History 201/203
Art Studio (Drawing Portfolio)	Art 241/243
Art Studio (2-D Portfolio)	Art 231
Art Studio (3-D Portfolio)	Art 233
Biology	Biology 243
Calculus AB or BC	Mathematics 251*
Chemistry	Chemistry 201/203 or 209 (Schulich School of Engineering only)
Chinese Language and Culture	Chinese 207
Computer Science A	Computer Science 217**
Computer Science AB	Computer Science 231 and 3 units (0.5 full-course equivalent) junior Computer Science*** or ENGG 233 (Schulich School of Engineering only)
Economics (Microeconomics)	Economics 201
Economics (Macroeconomics)	Economics 203
English (Language & Composition)	3 units (0.5 full-course equivalent) junior English+
English (Literature & Composition)	3 units (0.5 full-course equivalent) junior English+
Environmental Science	3 units (0.5 full-course equivalent) junior Science
French Language and Culture	French 227
German Language and Culture	German 333
Government & Politics (Comparative)	Political Science 201
Government & Politics (United States)	3 units (0.5 full-course equivalent) junior Political Science+
History (European History)	History 201
History (United States History)	3 units (0.5 full-course equivalent) junior History+
History (World History)	3 units (0.5 full-course equivalent) junior History+
Human Geography	3 units (0.5 full-course equivalent) junior Geography++
Italian Language and Culture	Italian 301
Japanese Language and Culture	Japanese 207
Latin	Latin 303
Music (Theory)	Music 211
Physics B	6 units (1.0 full-course equivalent) junior Physics+
Physics C (Electricity & Magnetism)	3 units (0.5 full-course equivalent) junior Physics+ or Physics 259 (Schulich School of Engineering only)
Physics C (Mechanics)	Physics 221
Physics C (Electricity & Magnetism) and Physics C (Mechanics)	3 units (0.5 full-course equivalent) junior Physics
Physics 1	3 units (0.5 full-course equivalent) junior Physics****
Physics 2	3 units (0.5 full-course equivalent) junior Physics****
Psychology	Psychology 200
Spanish Literature and Culture	Spanish 321
Statistics	Statistics 213

***Students who successfully complete a challenge examination may receive credit for Computer Science 231 in lieu of Computer Science 217.*

****Students who successfully complete a challenge examination may receive credit for Computer Science 233 in lieu of the junior Computer Science (3 units).*

*****Not acceptable in lieu of Physics 211/221 or 223*

† "Junior" refers to credit at the 200 level, but for which no direct University of Calgary equivalency exists.

†† Students who wish to major in Geography will be required to take Geography 251.

A.12.3 General Certificate of Education - Advanced Levels

Students will automatically receive advanced credit in approved courses where they present grades of "A", "B" or "C". Examination results must be verified by the appropriate examining board. Attested or certified copies are not acceptable. Credit has been determined as follows:

GCE Course	University of Calgary Equivalent
Biology	Biology 241/243
Chemistry	Chemistry 201/203 or 209 (Engineering only)
Economics	Economics 201/203
English	6 units (1.0 full-course equivalent) junior English†
English Literature	6 units (1.0 full-course equivalent) junior English†
Further Mathematics	3 units (0.5 full-course equivalent) junior Mathematics
History	3 units (0.5 full-course equivalent) junior History
Mathematics	Mathematics 249
Physics	Physics 221/223
Psychology	Psychology 200
Pure Mathematics	Mathematics 249
Statistics	Statistics 213/217

†"Junior" refers to credit at the 200 level, but for which no direct University of Calgary equivalency exists.

A.13 Admission Appeals

Admission to the University of Calgary is competitive. Meeting the minimum admission requirements outlined in this Calendar does not guarantee admission.

Admission decisions may not be appealed. Inquiries related to calendar regulations or admission requirements may be directed to the Admissions Office.

Applicants who have experienced exceptional circumstances that have impacted their academic record may apply under the Diverse Qualification Process outlined in Section A.9 by the Diverse Qualifications application deadlines.

If a student's circumstances change after the application deadline, contact the Associate Registrar, Recruitment and Admissions for assistance. Change of circumstances will be reviewed on a case by case basis by the Associate Registrar, Recruitment and Admissions and the Associate Dean of the Faculty to which the student is applying.

Students admitted to the Cumming School of Medicine (MD program), Veterinary Medicine, and Law, please see the Faculty website for admission appeal information.

A.14 Admission to Open Studies

Open Studies allows students to register in University of Calgary credit courses; however, students are not admitted to a program leading to a degree or diploma.

Students complete an Open Studies Application online available at ucalgary.ca/admissions/process/open.

Applicants who do not have a degree (non-degree): Applicants must submit transcripts from all high schools and post-secondary institutions attended.

Applicants who have a degree (degree holders): Transcripts from the last postsecondary institution attended.

To be eligible to registration under this category, students must meet one of the following requirements:

1. Must be 18 years of age or older by of the first day of the term to which they applying
2. Have completed or be in the process of completing a high school diploma, or equivalent, with a minimum average of 65 per cent
3. Have completed or be in the process of completing a degree from a recognized/accredited institution with a cumulative minimum 2.00 grade point average
4. Transfer students in good academic standing who have achieved a minimum 2.00 grade point average
5. Are part of a formal exchange agreement
6. Have obtained a letter of permission from their home institution (Visiting Student)
7. University of Calgary Alumni
8. Meet the admission requirements for the International Foundations Program
9. Meet the admission requirements for the Aboriginal Student Admission Program (ASAP)

The following students are not permitted to register under the Open Studies category:

(a) Students who are currently under suspension as they were required to withdraw from a faculty at the University of Calgary or from another post-secondary institution within the last twelve months;

(b) Continuing students whose registration has been denied due to enrolment restrictions.

Open Studies - Visiting Students

Visiting students must complete an Application for Open Studies and submit:

1. A letter of permission from their home institution indicating the specific courses approved to take and the term(s) approved to attend the University of Calgary.
2. A copy of their home institution university transcript which includes all courses, grades and academic standing received.
3. English Language Proficiency requirements.

Open Studies - Exchange Students

Open Studies Exchange students must provide the following:

1. Complete the Open Studies Exchange Student Application via the home institution's Exchange Co-ordinator. Permission to enrol and complete courses at the University of Calgary will be approved and submitted by the home institution. Students should consult with their home institution for application information and procedures.
2. A most recent transcript including all courses completed and grades achieved.
3. Must satisfy the University's English Language Proficiency requirement.

A.15 Auditing Regulations

1. Auditing privileges are extended to students who have been admitted as a Degree, Visiting and Open Studies students. Auditing students participate in classroom activities however may not be able to complete lab or tutorial components of a course. Students do not complete any exam or course assignments no receive a grade for the course(s) they are auditing. Students may be limited to the courses they can audit due to enrolment pressures.

   (a) The audit fees are outlined in the Fees section of this Calendar.

   (b) All auditing fees are non-refundable.
2. ACADEMIC STAFF, POSTDOCTORAL FELLOWS and VISITING SCHOLARS (not to be interpreted as visiting students) are eligible to audit without payment of fees, are not required to seek admission to the University, but must obtain written permission from the instructor of the course on a "Permission to Audit" form obtained from Enrolment Services. Such audits will not be recorded on an official transcript. Academic staff and visiting scholars who wish to have an audit course recorded on an official transcript must pay the regular audit course fees.
3. A course in which the student is registered and attends as an auditor, will be entered on the student's record. It will not count towards any degree or diploma program, nor will the student in an undergraduate faculty be permitted to change registration in that course from audit to credit or credit to audit status after the change deadline at the beginning of the term in which the course begins.
4. The auditing students shall, before admission to the class concerned, obtain written permission on a "Permission to Audit" form from: first, the Dean (or designate) of the faculty offering the course in which they would like to register in; and second, the instructor teaching the course. (Permission obtained from a dean (or designate) shall not bind the instructor to accept a student as an auditor in the class.

5. Applicants may audit a course which was previously successfully completed and may take for credit a course which was previously audited. Approval will be required as stated above.
6. Any student seeking to audit courses must meet all admission, registration and fee deadlines applying to regular students.

Academic Regulations

B. Registration

Most undergraduate students will complete course registration for the Fall and Winter Terms via MyUofC using their online Student Centre. It is strongly recommended that students obtain academic advising from their faculty or department advisors, as appropriate, prior to registration.

It is expected that students will follow the program outlined in this Calendar. Registration in a course does not indicate acceptance of the course for degree purposes. Faculties reserve the right to refuse a student's registration in courses when they are not appropriate to the degree program in which the student is registered.

Prerequisites are not normally waived. Minimum grades in prerequisite courses are required to ensure that students have prior knowledge and/or skills to be able to successfully engage with learning in more advanced courses. In some faculties, in exceptional cases, if a student can demonstrate that they have equivalent knowledge to prerequisites listed, then they may seek approval from the relevant department/faculty to enrol in the course. Please refer to individual faculties for more information.

The University of Calgary reserves the right, published requirements notwithstanding, to reject applicants for admission or registration in courses, even if they technically meet the entrance requirements, on the basis of their overall academic records or on the basis of grounds that, in the opinion of the University, are reasonable in the circumstances.

B.1 Student Accommodation

The Student Accommodation Policy and the Procedure for Accommodations for Students with Disabilities set out the University's obligation to provide reasonable accommodation to students when they have requested such an accommodation on a protected ground, in its role as a service provider, under the Alberta Human Rights Act. The detailed University policy and procedure document is available at: ucalgary.ca/policies/files/policies/student-accommodation-policy.

B.1.1 Accommodation of Students with Disabilities or Medical Conditions

Students who require an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities. To view the full procedure document see ucalgary.ca/policies/files/policies/student-accommodation-policy. Also, see section E.6 regarding Recording of Lectures and section G.3 Final Examinations. For additional information on support services and accommodations for students with disabilities, visit ucalgary.ca/access/.

B.1.2 Accommodations on Protected Grounds other than Disability

Students who require an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to their Instructor or the appropriate Associate Dean, Department Head or the department/faculty designated contact person. Students who require an accommodation unrelated to their coursework or the requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience). For additional information on support services and accommodations for students with disabilities, visit ucalgary.ca/access/.

B.2 Registration Priority and Procedures

All students will be assigned a Registration Appointment based on their academic record. Refer to the Enrolment Services website (ucalgary.ca/registrar) for further information. Students will not be permitted to register earlier than the date and time specified.

Registration instructions and a schedule of classes will be made available to students prior to the beginning of registration. On or after their registration date, students can register via MyUofC using their online Student Centre. At the time of registration, students should register in courses for both Fall and Winter Terms. Students may view and print their Timetable and Statement of Fees in their online Student Centre after they have registered.

Newly admitted students entering year one of a degree program will be mailed the necessary registration materials at the time of admission. Students are strongly encouraged to seek advice on course selection from the Student Advisors in their faculty. This should be done as early as possible.

Students are advised to register for courses as soon as they are eligible to ensure the best selection. Those admitted after registration begins are required to register within three weeks of the issuance of their notification of admission. Faculties reserve the right to rescind the offer of admission if course registration has not taken place within this time frame.

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Open Studies students with prior approval are able to register (add, drop and change courses) via MyUofC using their online Student Centre. Students not taking advantage of the prior approval procedure will register for courses at Enrolment Services.

Registration will begin for Open Studies students (degree and non-degree holding) on the dates noted online at the Enrolment Services website, ucalgary.ca/registrar (or check at Enrolment Services) for remaining spaces in all courses, except those courses which have been indicated by faculties and/or departments as being closed to such students.

Open Studies degree holders, at the time of initial application, must provide a transcript indicating courses completed and the degree awarded.

Visiting students may register via MyUofC using their online Student Centre after submitting the combined application/registration form available at Enrolment Services or at ucalgary.ca/registrar.

Visiting students will be permitted to register in Fall/Winter Term courses starting on a date noted online at Enrolment Services website, ucalgary.ca/registrar (or check at Enrolment Services).

At the time of registration, Visiting students must provide a written letter of approval from the home institution which gives the student permission to complete courses at the University of Calgary. The letter must indicate the number of courses as well as the term/year in which courses can be completed.

Exchange students are not eligible to register online and must register on a combined application/registration form through the Exchange Co-ordinator at their home university.

B.3 Withholds

Withholds may be placed on student access to registration and other services for reasons including, but not restricted to, the following: indebtedness to the University (fees, library fines, parking, residence, laboratory fees, etc.), faculty registration restrictions, outstanding documents, etc. Prior to registering for a term, students are advised to check for any withholds on their records. The issue(s) may then be dealt with to ensure any withhold is removed permitting the student access to course registration.

B.4 Schedule of Classes

The schedule of classes offered in each term is available before the opening of registration. The University reserves the right to make any changes it deems necessary including the cancellation of particular courses and to adjust a student's timetable to meet this schedule. Schedule of class information is available from the Enrolment Services website (ucalgary.ca/registrar) and via MyUofC using the online Student Centre. Students should refer to the Schedule of Classes to ensure that they are not selecting courses at overlapping times.

B.5 Course Enrolment Limitations

It should be noted that some faculties limit enrolment in their courses solely to students registered in their faculty or in a particular program, and that limits on class or laboratory sizes are frequently imposed. Refer to the Enrolment Services website, (ucalgary.ca/registrar) for a listing of such restrictions.

B.6 Block Week Courses

The University of Calgary has set aside five days at the start of Fall and Winter Terms as Block Weeks mainly for the offering of regular courses in an intensive manner. Dates for Block Weeks are given in the Academic Schedule.

The following regulations apply to courses offered during Block Weeks:

- Block Week is for the offering of regular credit and non-credit courses. Some courses will be available only in a Block Week format.
- Lectures for Block Week courses must be held within the days set aside at the beginning of Fall and Winter Terms. Permission of the Provost and Vice-President (Academic) is required to start or end a Block Week course earlier or later.
- The number of hours for attendance each day during Block Week shall not exceed eight hours. The total number of hours is recommended to approximate those offered during a regular term.
- Junior (200-level) courses may not be offered during Fall Term Block Week.
- The last day to drop a Block Week course (without it appearing on the student's transcript) shall be the end of the first day of lectures.
- The last day to withdraw from a Block Week course shall be the final day of lectures during the Block Week.
- Block Week courses beginning in the Fall may extend over both the Fall and Winter Block Weeks.
- Attendance at lectures, tutorials, laboratories, etc. will not be required beyond the duration of the Block Week(s). Students may be required to meet with instructors regarding assignments during the term.
- Although lectures, etc. are completed during the Block Week, students should be prepared to complete assignments and a final examination during the remainder of the term.
- Final grades for Block Week courses will not be required until the end of the term in which the course is offered.
- Final examinations for credit Block Week courses will be held during the regular examination period at the end of the term. In lieu of a final examination, a take-home final examination can be given out on the last day of lectures. Tests held on the last day of lectures cannot be worth more than 10 per cent of the final grade. Exceptions to these regulations require the approval of the Provost and Vice-President (Academic).

- Pre-term study is not permitted in Block Week courses unless the deadline to register in the course is one month in advance of the start of lectures. Sending of pre-term study materials to registered students shall be the responsibility of the department and/or faculty offering the course.
- A Block Week course can be a prerequisite for a regular credit course. Normally, a prerequisite course will not be offered in the Block Week immediately preceding the term in which the follow-up course is being offered.
- Where a mandatory course for a degree is available only in the Block Week format, departments shall make arrangements for students who, for legitimate reasons, are unable to complete a course during Block Week.
- Use of a Block Week format will not be indicated on the student's transcript of record.
- It is at the discretion of the faculty in which a student is registered as to the number of courses that a student may attempt during a term, including Block Week courses.
- All Block Week courses will be subject to the GFC approved policy on Universal Student Ratings of Instruction.

B.7 Part-Time Studies

The University of Calgary provides courses on weekends and evenings, particularly those which support the Communications Studies minor in the Bachelor of Communication and Culture program. However, students are cautioned that they may not be able to depend on being able to complete a full degree without also taking some courses during regular workday times.

B.8 Graduate Level Courses

University of Calgary undergraduate students are permitted to register in graduate level courses only with permission of both their Faculty and the Department offering the course. Undergraduate students are not normally permitted to take courses numbered 700 level or above. Access to graduate level courses (numbered 600 and above) for Visiting and Exchange students is limited to those admitted to a graduate program. For Open Studies and other students, access to graduate courses is restricted to those with adequate preparation, normally an undergraduate degree or the equivalent. Permission for an Open Studies or other student to register in any graduate level course must be obtained from the Faculty of Graduate Studies office.

B.9 Repeating Courses

A student may repeat a course previously attempted (excluding withdrawals) only once. To repeat a course more than once requires the permission of the faculty in which the student is registered and the department offering the course. Permission is granted only under exceptional circumstances.

Students repeating courses taken at the University of Calgary will not have the original grade, failure or otherwise, removed from the transcript of record. The transcript of record will indicate both the original grade and the repeated course with its final grade in the term in which it was taken.

Taking or repeating a course that is a prerequisite for a higher level course after having completed the higher level course with a grade of "C-" or better will be allowed only with the permission of both the faculty in which the student is registered and the department offering the course.

B.10 Faculty Approval of Course Selections

Students should obtain the advice of their faculty in selecting courses; however, the student is ultimately responsible for the correct selection. Faculties reserve the right to cancel a student's registration in a course, regardless of the date, if the student fails to meet a stated prerequisite. Approval for waiver of prerequisites must be obtained prior to registration in a course.

B.10.1 Credit in Courses by Special Assessment (Challenge Examinations)

Some faculties will allow students who feel knowledgeable in the subject matter of a particular course to seek credit through special assessment (i.e., subjecting to an examination only without attending the course and completing all requirements in the normal way during a regular term). Faculties and departments are free to determine which, if any, of their courses may be taken by special assessment, by any particular student, and to determine the nature and scheduling of the examination or assessment procedures involved. The evaluation must be completed and a grade reported by the specified deadline for that particular academic term. Only those courses listed on the Schedule of Classes and offered during an academic term may be taken by special assessment.

To complete a course under this policy, a student must obtain written permission by the registration deadline from the head of the department offering the course and the Dean's Office of the faculty in which the student is registered, on appropriate forms headed "Credit by Special Assessment" (available from ucalgary.ca/registrar under Forms for Students).

Upon submission of a completed form to Enrolment Services, students may no longer cancel their registration in the course being taken by special assessment or withdraw from the course being completed in this manner.

It should be noted that in all cases the fees for taking a course by special assessment are the same as regular course fees.

Failures in courses completed by special assessment shall be noted on the student's permanent record in the same manner as a course completed by attending lectures.

A course in which the student was previously registered may not be taken subsequently by special assessment, nor may any course be attempted more than once in this way.

Students wishing to seek credit for courses by this method are advised to contact their faculty offices for faculty regulations and to determine the number of courses which may be completed by this method in a given year or program.

B.11 Course Load

Normally the maximum course load for a student in Fall or Winter Term is five courses; however, this is subject to individual faculty requirements. Students wishing to take more than the normal course load require faculty approval.

B.12 Student Responsibility

Each student is personally responsible for the continuing completeness and accuracy of their course registration. Advice is available from faculty or department offices. Students should ensure that courses selected are appropriate to their degree program, including the number of courses to complete requirements for graduation. Particular care should be exercised with the sequence in which courses are taken to meet any prerequisite or corequisite requirements.

Each student is also responsible for any change of registration made necessary by the results of final grades at the end of a term.

B.13 Changes of Courses or Course Sections

Students wishing to drop a course or change from one course to another may do so via MyUofC using their online Student Centre.

No student may attend a section of a course in which they are not officially enrolled.

No changes in courses will be permitted later than the dates specified in the Academic Schedule.

B.14 Withdrawal from Courses and Withdrawal from the Term

Students who withdraw from course(s):

- Prior to the registration deadline will have the course(s) removed from their permanent record and will not be required to pay fees for the course(s),
- After the registration deadline will have the withdrawal recorded on their permanent record and will receive no fee refund.

Newly admitted students who do not attend the term to which they were admitted must reapply for admission, and will be considered using the admission criteria in effect at the time of re-application.

Students in the Faculties of Education, Nursing, and the Schulich School of Engineering who are withdrawing completely from a term after the registration deadline may not withdraw using the online Student Centre and must submit a Notice of Withdrawal form to Enrolment Services **prior to the deadline date for withdrawal.** Students in all other Faculties may withdraw completely from a term via MyUofC using their online Student Centre.

Withdrawal using the online Student Centre will not be permitted if a student has previously withdrawn from the same course or already has 30 units (5.0 full-course equivalents) withdrawals. For such withdrawals, students must obtain faculty approval. Students are also not permitted to withdraw from specific courses without faculty approval (e.g., practicum courses).

Students not eligible to withdraw via MyUofC using their online Student Centre must withdraw by completing a Change of Registration form and obtaining approval from their faculty office. Certain faculties may require the approval of the course instructor prior to approving the withdrawal form.

Students will not be permitted to withdraw more than once from a particular course. Students will be required to withdraw from their faculty and the University if they have accumulated a total of more than 30 units (5.0 full-course equivalents) withdrawals while in attendance at the University of Calgary.

Students shall have been informed by their instructors of the grades **currently earned** by one week before the withdrawal deadline in all courses. (Provided a term paper, assignment or test has been submitted with sufficient time for marking.)

The date of withdrawal from a course or from the term will be noted on the student's permanent record. The date of withdrawal from the term or course will be the date the dean of the faculty signed the Withdrawal or Change of Registration form or the date the student withdrew online using the online Student Centre at MyUofC.

B.15 Payment of Fees or Notification of Financial Assistance

A student's registration is not complete until the balance of fees for any term has been paid. Fees are due and payable by the prescribed deadlines. (See Tuition and General Fees section for details.)

Students whose fees are not paid by the prescribed deadlines and who have not applied for financial assistance will not have their course registrations cancelled and will be indebted to the University for their tuition and general fees. Interest will be charged on outstanding balances at an annual rate as determined by the University (12 per cent at the time of the printing of this calendar). Fee and interest rates may be subject to change without prior notice.

Students who apply for financial assistance and subsequently decide not to attend University, must advise Enrolment Services to cancel their registration before the deadline for fee payments, otherwise, they will be indebted to the University for their tuition and general fees.

B.16 Fee Refund

No refund of tuition and general fees will be made after the change of registration deadlines given in the Academic Schedule.

B.17 Change of Personal Information

Students should promptly inform Enrolment Services of changes in personal information - changes in contact information, name, citizenship, etc. Students who wish to change their surnames or given names must provide proof in the form of legal documentation. A Change of Personal Information form, for this purpose, is obtainable at Enrolment Services or on the web at ucalgary.ca/registrar.

Students should change their contact information via MyUofC using their online Student Centre. **The University is not responsible for incorrect mailing and for missed deadlines, etc. due to the student's failure to report a change of contact information.**

It is to the student's advantage even after graduation to maintain an up-to-date contact information at the University.

B.18 Changes in Regulations

The University reserves the right to make changes in regulations governing degree programs from time to time. All such changes apply to new and continuing students. However, students continuing in the same program will be phased into the new program regulations without extending the number of courses required for their degree. Where a required course for a degree program is no longer offered, the faculty may specify an alternate. Students who interrupt their program by a Fall or Winter Term or more will be required to comply with new regulations upon resumption of their studies. Students should annually refer to the Calendar for appropriate faculty regulations governing their degree programs.

B.19 Open Studies Registration

An Open Studies Visiting student will be subject to all rules and regulations applicable to students of the University of Calgary.

Open Studies students are permitted to register in courses via MyUofC using their online Student Centre. Enrolment appointments are assigned and reflected on the Student Centre.

Open Studies students are permitted only one "D" or "D+" grade; students who obtain an "F" grade or a second "D" or "D+" grade will be refused further registration as an Open Studies student. Academic Review for discontinuation takes place at the end of the Winter Term and the end of the Summer Term.

Open Studies students are not permitted to register in 700-level or above courses.

Open Studies – Non-Degree Holder: Open Studies students are eligible to register in a maximum of 9 units per term to a maximum of 30 units.

Open Studies - Degree Holder: Open Studies degree holders are eligible to register in a maximum of 15 units per term to a maximum of 30 units.

Open Studies – Exchange and Visiting Students: Open Studies Exchange and Visiting Students are eligible to register in a maximum of 15 units per term to a maximum of 30 units.

It is the responsibility of the student to ensure selected courses are approved for transfer credit by their home institution prior to commencement of courses.

It is the student's responsibility to arrange for an official University of Calgary transcript to be sent their home institution at the end of the academic term.

B.19.1 Aboriginal Student Access Program (ASAP)

Students enrolled in the Aboriginal Student Access Program can take up to three 3-unit university courses per semester. In exceptional circumstances and with the approval of the ASAP Co-ordinator, students may be permitted to take up to four 3-unit university courses. Course selection shall be a combination of ASAP core courses requirements and electives that are directed to a student's desired academic program. Students are also permitted to take upgrading courses concurrent with their university courses, if required.

For details on the ASAP program and admission requirements, see section A.8.1 Aboriginal Student Access Program.

Program Curriculum

The Program offers the following first-year, university-level courses:

Fall

Academic Writing (ACWR) 201 – Academic Writing for Specialized Audiences I (Introductory)

Indigenous Studies (INDG) 201 – Introduction to Indigenous Studies

University (UNIV) 205 – Learning Beyond High School: Theories and Practices

Options: students make take one upgrading course

Winter

Academic Writing (ACWR) 203 – Academic Writing for Specialized Audiences II (Introductory)

English (ENGL) 201 – Approaches to Literature

Options: students may take one elective course (credit) and one upgrading course

Upgrading courses may be taken through Continuing Education at the University of Calgary (or other adult learning institutions) in conjunction with University of Calgary ASAP courses.

For more information, contact the Native Centre at 403-220-6034 or email ASAP@ucalgary.ca

C. Competence Test

C.1 Mathematics Diagnostic Test

Mathematics II, offered by Continuing Education, with a grade of "D" or better is acceptable in lieu of Pure Mathematics 30 for general admission requirements.

Students who wish to enrol in courses in the Faculty of Science for which Pure Mathematics 30 is a prerequisite, and who wish to use Mathematics II to satisfy that prerequisite, must achieve a grade of "C-" or higher in Mathematics II.

Students whose programs require Mathematics 211 or 213 and/or 249 should note that entry to these courses is restricted to students who have met one of the following three prerequisites:

(a) A grade of 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30;

(b) A grade of "B-" or 70 per cent or better in the non-credit courses Mathematics II or College Algebra and Trigonometry offered by Continuing Education;

(c) A grade of 70 per cent or higher on the Mathematics Diagnostic Test administered by the Department of Mathematics and Statistics.

For entry to Mathematics 265, students must present one of the above and Mathematics 31.

Notes:

1. Students meeting prerequisite (a) should enrol directly into Mathematics 211 and/or 249; students meeting prerequisite (a) plus Mathematics 31 should enrol directly into Mathematics 265; all other students must take either Mathematics II or College

Algebra and Trigonometry or must write the Mathematics Diagnostic Test.

2. The prerequisite for Mathematics II is Mathematics I or Pure Mathematics 20. Students who have not completed one of these prerequisites (including those who have completed Applied Mathematics 30) are directed to begin with Mathematics I.

3. Students who completed Pure Mathematics 20, but feel their skills are not current enough to take Mathematics II, are encouraged to take the Mathematics II Assessment Test administered by Continuing Education.

4. Students from outside Alberta who previously studied the material in Mathematics I also may be required to take the Mathematics II Assessment Test.

The Mathematics Diagnostic Test is a one hour test of the student's mastery of topics in Pure Mathematics 10, 20 and 30. It is offered four times per year. After receiving their notice of admission, newly admitted students who wish to write the Mathematics Diagnostic Test are advised to do so at the earliest opportunity.

The test is offered during the week preceding the start of classes in each of the Fall, Winter, Summer Terms (including Spring Intersession).

The fee is $50.00 for each taking of the test. The fee must be paid at Enrolment Services (MacKimmie Block 117) in advance of the test date; **students are required to present proof of payment for admission to the test.**

The test is administered on a computer and the results are available to the student immediately.

The Mathematics Diagnostic Test has the same status as a University final examination. Accordingly, any form of cheating is considered grounds for suspension or expulsion from the University. Proof of identity is required during the test. Students more than thirty minutes late will not be admitted to the examination.

Information about the test is available from the Undergraduate Office in the Department of Mathematics and Statistics.

D. Change of Faculty or Program

Requests for a Change of Program may be made through the online Student Centre via MyUofC. The deadline dates for Change of Programs are as follows:

Fall Term:

February 1: All programs

Winter Term:

September 1: Faculty of Nursing (Transfer and Degree Holder Routes only).

December 1: All programs within the Faculties of Arts, excluding programs in Dance, Drama, Earth Science, Economics, International Relations, Law and Society, Music, Psychology or Visual Arts; Kinesiology; Science, excluding programs in Biological Sciences, Computer Science, Chemistry, Environmental Science, Geoscience, Nanoscience and Neuroscience.

Note: The Haskayne School of Business, Cumming School of Medicine, Schulich School of Engineering, Faculty of Social Work, and Werklund School of Education do not accept transfer students for the Winter Term. Change of Programs to the Faculty of Kinesiology for the Winter Term will be considered only if the quota permits additional admissions.

Note: Change of Programs to combined degree programs must be submitted by the deadline date of the faculty with the earlier deadline.

Spring Intersession:

March 1: All faculties

(except those noted below)

Summer Intersession:

May 1: All faculties

(except those noted below)

Note: Change of Programs to the Faculties of Art (Drama, Music, or Visual Arts only), Cumming School Medicine, Haskayne School of Business, Faculty of Nursing, Schulich School of Engineering, Faculty of Social Work and the Program of Dance are not accepted for the Summer Term (including Spring Intersession). The Faculty of Kinesiology recommend that students enter the Fall Term. Change of Programs to the Werklund School of Education for the Summer Term will be considered only for those students who are seeking admission to a Degree program with a Summer intake.

Students who wish to request a Change of Program for the Summer Term should contact their Faculty.

Owing to the short period between the end of examinations in the Fall Term and the start of classes in the Winter Term, students wishing to transfer to a different faculty or program between the Fall and Winter Terms will be allowed to register for courses in the new faculty if they are admissible prior to release of Fall Term grades. If, as a result of the Fall Term grades, the transfer is not approved, the student will be returned to their original faculty provided they have not been required to withdraw. Students re-admitted to their former faculty will be cancelled from Winter Term courses which do not fit their degree program, regardless of the date. New courses can only be selected up to the deadline date specified in the Academic Schedule.

E. Course Information

E.1 Course Outlines

Every course is required to have a course outline that provides the overall structure and requirements of a course and informs students about the kinds of learning experiences they can expect in the course. Course outlines are to be submitted to departmental offices (or in the case of non-departmentalized Faculties or interdisciplinary programs, the Dean's Office). The home unit head is required to approve course outlines and confirm that the required elements listed below are included.

Each instructor responsible for a course is required to make a course outline available to each student no later than the first meeting date for the course. It is expected that the course outline (or in the case of clinical and professional practice-based courses, a Faculty–approved alternate document) will be available as a web-based document or through the learning management system (i.e. Desire2Learn). If it is not, a paper version of the outline will be handed out to every student at the first meeting of the class, and made available for those unable to attend the first class.

In addition to the required general information (number and title of course, name of the instructor, day, place and time of regular classes, prerequisites/corequisites, etc.) each course outline must contain the following:

(a) Course objectives/learning outcomes of the course;

(b) Required (and recommended) textbooks, readings, materials including electronic resources;

(c) Information on grading methods and/or scales used in the course;

(d) In all courses where exemptions to the Examination and Tests regulations are approved by the Dean or the Dean's designate, the exemption should be noted in the course outline.

(e) The weights to be assigned to the various components which are to be considered in determining the final grade (term papers, laboratory work, class participation, tests, final examinations, etc.). This weighting may not be changed during the term or at the time of grade reporting;

(f) Whether or not a passing grade on any particular component of a course is essential if the student is to pass the course as a whole;

(g) Whether or not there will be a final examination and if an examination is held, whether the use of aids such as open book, etc., are permitted;

(h) Whether students in the course may be expected to participate as subjects or researchers when research on human subjects may take place;

(i) When writing and the grading thereof is a factor in the evaluation of the student's work (see E.2 Writing Across the Curriculum statement);

(j) A list and description of approved optional and mandatory supplementary fees for courses;

(k) Academic Accommodations. It is the student's responsibility to request academic accommodations and according to the University policies and procedures listed below.

The student accommodation policy can be found at: ucalgary.ca/access/accommodations/policy.

Students needing an Accommodation because of a Disability or medical condition

should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities ucalgary.ca/policies/files/policies/student-accommodation-policy.

Students needing an Accommodation based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to "(Instructor) (Associate Dean) (Department Head) (other designated person)".

The course outline should clearly list the appropriate contact person and their contact details.

(l) Information regarding the Freedom of Information and Protection of Privacy Act and how this impacts the receipt and delivery of course material.

(m) Information on academic misconduct and the consequences thereof;

(n) Emergency Evacuation/Assembly Points(ucalgary.ca/emergencyplan/assemblypoints);

(o) Internet and Electronic Communication Device information;

(p) Safewalk information;

(q) Student Union or Graduate Student representative contact information;

(r) Link to the Student Ombuds' Office (ucalgary.ca/ombuds/) ombuds@ucalgary.ca.

Instructors will also indicate in the course outline the use of calculators and/or electronic devices that will be allowed. In the absence of a written statement, the presumption is that the use of any calculators and/or electronic devices during examinations will not be allowed.

Instructors have the authority, at the discretion of the dean of their faculty, to require that specific course assignments, term papers and academic exercises be submitted in an electronic format. Instructors cannot require that multiple copies of an assignment be submitted.

E.2 Writing Across the Curriculum

Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The University supports the belief that throughout their university careers, students should be taught how to write well so that when they graduate their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their university courses and, where appropriate, members of faculty can and should use writing and the grading thereof as a factor in the evaluation of student work. The services provided by the Writing Support, part of the Student Success Centre, can be utilized by all undergraduate and graduate students who feel they require further assistance.

E.3 Attendance

The University has directed that attendance will not be considered when assessing a student's grade **except in certain courses where class participation may be a necessary component of the course.** Regular attendance is advised for students in all courses and there is no regulation which precludes an instructor from taking attendance in the class.

The full responsibility for meeting class and laboratory assignments, tests and term papers of the section of the course in which a student is officially registered lies solely with the student. It is the responsibility of students who have **prolonged absences** from class because of physical and/or emotional health problems to present to the faculty office offering the course a statement from a physician/counsellor attesting to the physical or emotional health of the student. It is expected that this statement will normally be given only if the student present themselves to a physician/counsellor while the problem still exists rather than after recovery.

A student who is absent from a test for legitimate reasons must discuss an alternative course of action with the instructor. The instructor at their discretion may transfer the percentage weight for the test to the final examination, if there is a final examination in the course, set another test, etc. An instructor will normally make this decision on the basis of verbal information provided by the student. In the event that an instructor feels that they cannot judge the veracity of the information provided, the student may be required to submit a completed Physician/Counsellor Statement form to confirm an absence for health reasons. Students must be aware that they are responsible for payment of any charge associated with the medical assessment and documentation as this service falls outside the realm of services provided by the Provincial Health Care Plan.

See also G.6 Deferral of Final Examinations or G.7 Deferral of Term Work.

E.4 Religious/Spiritual Observance

The University recognizes and respects the diversity of its members, including diversity of religious faiths and observances. It is understood that some students may not be able to attend classes, write tests or write final examinations on days of observance. Students should consult the Student Accommodation Policy (ucalgary.ca/policies/files/policies/student-accommodation-policy) for further information. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than 14 days prior to the date in question.

The Faith and Spirituality Centre provides further information on holy days (ucalgary.ca/fsc/resources/general-resources).

E.5 Ethics of Human Studies

The University is concerned with safeguarding the rights of people in the conduct of its affairs both on and off campus. Students may be requested to serve, on a voluntary basis, as human research subjects for certain of their courses. In such instances, the course outlines prepared by instructors must describe the students' expected roles as subjects. Courses may also follow the pedagogical practice of assigning students to serve as apprentice researchers, e.g., interviewing community members. In all course work dealing with human studies, the usual ethical guidelines with respect to risks and benefits, informed consent, deception, privacy and confidentiality must be followed both by students and their instructors. Students should be referred to departmental ethics committees for information in regard to ethical safeguards. (Further details may be found in the University of Calgary publication entitled Ethics of Human Studies).

E.6 Recording of Lectures

Recording of lectures other than audio recordings, as outlined below are not permitted.

Audio recording of lectures, other than where an audio recording is an accommodation, shall be permitted for individual private study only at the discretion of the instructor. For any other use, whether by duplication, transcription, publication, sale or transfer of recordings, written approval must be obtained from the instructor for the specific use proposed. Any use other than that described above constitutes academic misconduct and may result in suspension or expulsion.

Any student with a disability who is registered with Student Accessibility Services (SAS), and who requires an accommodation to make audio recordings of course material shall be provided with such an accommodation if determined necessary by an Access Advisor in SAS.

With the permission of the instructor, students without a formal accommodation may audio record lectures, provided that the student and instructor sign a release form available from departmental and faculty offices. A copy of the Release form shall be retained by the instructor and by the department in which the course is offered. Any audio recording by students is permitted only for the purposes of private study by the individual student.

Students are cautioned that lectures, demonstrations, performances, and any other course material provided by an instructor may include copyright protected works. The Copyright Act and the copyright law protect every original literary, dramatic, musical and artistic work, including lectures by University instructors. Any audio recording by students is permitted only for the purposes of private study by the individual student. Students may not distribute, email or otherwise communicate these materials to any other person.

Students are encouraged to make notes of classroom discussions, lectures, demonstrations, and performances in order to advance their own learning and to develop a record for purposes of private study. The ordinary process of taking notes is encouraged since this practice requires that students develop the ability to actively attend to the material under consideration and to quickly summarize pertinent information in a coherent manner. Electronic or mechanical recording of lectures discourages the development

of these important skills. In addition, the presence of audio recording devices may inhibit frank and open discussion of course material in the classroom, or otherwise interfere with the proper academic conduct of the class.

This regulation applies to all forms of electronic or mechanical recording of lectures, laboratories, tutorials, presentations, performances, electronic (computer) information, the duplication of course material, and to the translation of recordings or transcriptions of any of these materials to another form by electronic or mechanical means.

F. Academic Standing

F.1 Grading System

Students shall have been informed by their instructors of the grades **currently earned** by one week before the withdrawal deadline in all courses. (Provided a term paper, assignment or test has been submitted with sufficient time for marking.)

The official grading system must be used to report final grades to Enrolment Services but need not be used for individual assignments, quizzes, etc. An instructor electing not to use the official system for a particular component(s) of a course must provide the class, in the same format that was used for the course outline, with an interpretation of the system being used which would enable students to determine their standing within the official system. Such feedback will be provided on the course outline or the first time feedback is given to students. Departmental/Faculty approval is required in the same manner as for the course outline. This interpretation can subsequently be changed only if the grades of registered students in the section of the course will not be lowered. Departmental/Faculty approval is required in the same manner as for the course outline. Any concerns about changes to the interpretation are first to be addressed to the Department Head or equivalent in non-departmentalized faculties. Students not satisfied should contact the Faculty office to follow normal appeal procedures.

It is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades.

The University will not undertake any official conversion or equation of the University of Calgary's letter grades with any percentage or other grading systems.

F.2 Undergraduate Grading System

Grade	Grade Point Value	Description
A+	4.00	Outstanding
A	4.00	Excellent-superior performance, showing comprehensive understanding of subject matter.
A-	3.70	
B+	3.30	
B	3.00	Good - clearly above average performance with knowledge of subject matter generally complete.
B-	2.70	
C+	2.30	
C	2.00	Satisfactory - basic understanding of the subject matter.
C-	1.70	Receipt of a grade point average of 1.70 may not be sufficient for promotion or graduation. (See individual undergraduate faculty regulations.)
*D+	1.30	
*D	1.00	Minimal pass - marginal performance; generally insufficient preparation for subsequent courses in the same subject.
F	0	Fail - unsatisfactory performance or failure to meet course requirements.
**I	0	Incomplete - unsatisfactory (effective January 2007).

**Passing grades; the number of "D" and "D+" grades acceptable for credit is subject to specific undergraduate faculty promotional policy.*

*** Not all work has been submitted, or may be used if instructor knows that an application for a Deferred Exam has been made. If all work is submitted, but unsatisfactory, an F-grade would be awarded.*

The Faculty of Law, in addition, uses a CR/D/F system for certain of its courses.

A system of grading which carries no weight in the determination of grade point averages (as follows) is used by the Cumming School of Medicine for its MD program.

CR - Completed requirements

RM - Remedial work required

F - Fail

Certain courses in other faculties are also graded on a CR/F basis and are identified by the notation "Not Included in GPA" in the course description section of this Calendar. The grades in these courses are not included in the calculation of the grade point average. Such courses may be required in certain programs for graduation purposes, as indicated in the faculty sections of this Calendar, but will carry no weight in the determination of grade point averages.

University policy requires that students' grades in a course are reported according to the grading scheme of the faculty giving the course (regardless of the faculty in which a student is registered) and are so recorded on students' transcripts of record.

F.3 Graduate Grading System

Students registered in the Faculties of Environmental Design and Graduate Studies are graded using a letter-based system. Please refer to the Faculty of Graduate Studies Calendar for details.

F.4 Symbols

AE - Aegrotat standing

AU - Auditor

GP - Grade Pending (Implies Deferred Final Exam (DFE) or Deferral of Term Work (DFT)

MT - Multi-Term

RW - Required to withdraw

SF - Special deferred examination

W - Withdrew

X - Grade not reported by instructor

F.5 Grade Point Average

All grades are used in the calculation of yearly grade point averages, both for purposes of the official transcript of record and cumulative grade point averages determined by the faculties. For promotion or graduation, many faculties do not use a cumulative grade point average; instead, they use a continuous grade point average that excludes lower grades in repeated courses and/or grades in courses that are extra to the degree. Refer to individual faculty sections for promotion and graduation requirements.

In the determination of the grade point average, courses are weighted by the unit value of the course (e.g. 6 units or a full-course equivalent, 3 units or half-course equivalent, etc.)

Example:

Since F=0, D=1, C=2, B=3, A, A+=4, B-=2.7 (See Undergraduate Grading System), a student who completed 6 units (3.0 full-course equivalent) and 12 units (4.0 half-course equivalent) with grades A+, B, C, D, F, A and B- respectively would have the grade point average computed in the following manner.

6 unit courses (full-course equivalents):

6 units x 4 (A+) = 24

6 units x 3 (B) = 18

6 units x 2 (C) = 12

3 unit courses (half-course equivalents):

3 units x 1 (D) = 3

3 units x 0 (F) = 0

3 units x 4 (A) = 12

3 units x 2.7 (B-) = 8.1

Totals

30 units = 77.1

77.1 ÷ 30 = 2.57 Weighted Grade Point Average

F.6 Honours Degrees and Degrees with Distinction

Honours degrees are available from the Faculty of Arts, Kinesiology, Medicine (BHSc) and Science. Please refer to the graduation requirements for Honours degrees in the faculty sections of this Calendar.

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of a candidate for the degree of BA, BSc, BComm, BSc (Engineering), BFA, BKin, BMus, BN, BSW or JD if the candidate has obtained the required weighted average as defined under faculty promotional policy.

A student who has taken part of their work at another university may be granted a

degree "With Distinction" at the discretion of the faculty concerned.

F.6.1 Dean's List

The Faculties of Arts, Cumming School of Medicine (BHSc), Haskayne School of Business, Kinesiology, Law, Nursing, Schulich School of Engineering, and Science have a Dean's List. Requirements for inclusion on the Dean's List are given in each faculty's section of this Calendar. Placement on a Dean's List will be noted on the student's transcript.

F.7 Unsatisfactory Standing

All faculties review a student's performance for continuation in a program. University regulations require that an undergraduate student, at the time of review, be required to withdraw from the University if the student's grade point average is less than 1.70. A few faculties have higher requirements for continuation in a program.

Students will be permitted a maximum of one probationary period while registered as undergraduate students at the University of Calgary. Students will be required to withdraw rather than be placed on probation for a second time. Probationary periods that have occurred in excess of five years previous will not be counted.

A faculty council may refuse permission to a student or prospective student to enter any year of any program, if, in the opinion of that council, the student shows a lack of general educational attainment. **Further, a student whose record in the classroom, in tests, or in final examinations is unsatisfactory may at any time be required to withdraw from the faculty in which they are registered.**

The records affecting promotion and graduation of all students in the University are reviewed by persons designated by the faculty council. A student whose record is then found to be unsatisfactory will be so notified by the dean. The student may be required to withdraw from the faculty or to repeat the year. Students who receive letters concerning poor scholarship are reminded that the Counselling Centre is available to discuss this matter.

Notwithstanding specific regulations regarding probation and progress in program, students' academic standing may be reviewed at any time and, at the discretion of the dean or designate, a student may be permitted to continue in program under specified conditions or required to withdraw if specified conditions of admission or continuation in program are not met. These conditions shall be specified in writing by the dean or designate to the student.

The transcript of record will indicate if a student has been required to withdraw or placed on probation due to unsatisfactory standing. This notation will not be removed from the transcript of record.

Students who have been required to withdraw from a faculty at the University of Calgary and wish to return must re-apply for admission to the University by the stated deadlines. In order to be re-admitted, such applicants may be required to have completed a specified amount of course work with acceptable grades at another institution before re-admission will be granted. Consultation with the faculty to which re-admission will be sought is strongly recommended. Such applicants will not receive preference over new applicants. An interview with the dean of the faculty they wish to enter may also be required.

For specific faculty promotional policies, please refer to the statements in each faculty section of this Calendar.

F.8 Aegrotat Standing

Aegrotat standing (i.e., standing granted to a candidate who is prevented by illness from attending final examinations) may be granted by the faculty council offering the course(s) to a student registered in either of the last two years of any program. It should be noted that aegrotat standing may only be granted for courses in which the student is registered and attending.

Any student wishing to take advantage of this should apply to the dean of the faculty concerned.

F.9 Transcripts

An official transcript is a complete and unabridged record of a student's academic history at the University of Calgary. Official transcripts bear the University seal and signature of the Registrar. Official transcripts may be sent directly to an institution or provided to the student, either by mail in sealed envelopes or in-person. Transcripts will not be released without authorized consent from the student.

A transcript will not be issued if the student has any outstanding financial obligations at the University.

Students may request copies of their official transcripts via MyUofC, in-person at Enrolment Services, or by submitting the Transcript Request form. Courier delivery options are available for a fee. Visit Enrolment Services (ucalgary.ca/registrar) for more information.

A copy of student transcripts detailing courses and credits earned is available to students via MyUofC. These transcripts do not bear the University seal or the signature of the Registrar.

G. Examinations and Tests

Effective evaluation practices require that students have multiple opportunities to demonstrate their learning and receive feedback. This principle underlies the following regulations:

- The final exam may not count for more than 50 per cent when calculating the final grade, except in the cases of clinical or professional practice-based courses in academic programs leading to professional designation, registration and/or licensing.
- In clinical or professional practice-based courses in academic programs leading to professional designation, registration and/or licensing, regardless of their duration, student learning may be formally evaluated at the end of the learning experience, as long as effective formative feedback processes are in place at intervals during the course.
- In courses that do not extend over a standard term, and with the approval of the Dean or the Dean's designate, evaluation weightings may be non-standard as long as the evaluation plan includes opportunities for students to receive feedback on their learning at intervals during the course.
- Exemptions to the Examination and Tests regulations may be made on pedagogical grounds with the approval of the Dean or the Dean's designate.
- In all courses where exemptions to the Examination and Tests regulations are approved by the Dean or the Dean's designate, the exemption should be noted in the course outline.
- Regardless of the format of a course, any external accreditation requirements must be met (or exceeded) in the evaluation plan for a course.

G.1 Scheduling of Tests

Tests must be scheduled within regular class time except in those special cases where prior approval has been obtained from the dean of the faculty offering the course.

Common mid-year tests in courses that run over more than one term must occur during the final examination period, and must be scheduled by the Registrar, except:

- Mid-year tests that are take-home or oral tests, or mid-term projects.
- Mid-year tests in Law, Medicine (MD program only) and Veterinary Medicine, which are scheduled by each Faculty. The Faculty of Environmental Design also schedules its own mid-year tests except for courses in the Architectural Studies minor.

In courses completed over a standard term, any tests carried out during the last 14 calendar days of the term (as defined in the Academic Schedule) may not account in total for more than 10 per cent of the final grade, except in the case of laboratory or oral testing, take-home examinations or terminal projects. This regulation does not apply to tests held at the end of the Fall Term in full courses which run over both Fall and Winter Terms, in clinical or professional practice-based courses, or in courses that do not extend over a standard term (see G. Examinations and Tests).

For information regarding absence from tests, please refer to E.3 Attendance.

G.2 Proof of Identity

G.2.1 Tests

Invigilators of any tests may, when they have reason to believe there is cause to do so, challenge any candidate to produce proof of identity either in the form of the University of Calgary ID card (Unicard) or government-issued photo ID.

If there is clear evidence that impersonation has occurred, the individual shall not be permitted to continue the test and shall be reported immediately to the dean or delegate of the faculty in which the course is offered.

A student who is not able to provide acceptable proof of identity may be permitted to continue the test if the student agrees to provide verification at a later date. If verification is not provided, then the student will receive an "F" on the test, and the matter will be referred to the dean or delegate of the faculty in which the course is offered for further disciplinary action.

G.2.2 Final Examinations

All candidates for final examinations are required to place their University of Calgary ID cards (UNICARD) on their desks for the duration of the examination. This requirement is publicized at the time of posting of the examination timetable each session.

Students without an ID card who can produce an **acceptable** alternative ID, e.g., government-issued photo ID, will be allowed to write the examination.

A student without acceptable ID will be required to complete an Identification form. The form indicates that there is no guarantee that the examination paper will be graded if any discrepancies in identification are discovered after verification with the student's file.

A student who refuses to produce identification or who refuses to complete and sign the form will not be permitted to write the examination. The circumstances will be reported immediately in writing to the dean and to the Registrar for consideration of further disciplinary action.

G.3 Final Examinations

Any final examination scheduled by the Registrar is held in the examination period following the session in which the course was completed, as defined in the Academic Schedule.

Students requiring an accommodation because of disability or medical condition should contact SAS in accordance with the Procedure for Accommodations for Students with Disabilities available at: ucalgary.ca/policies/files/policies/student-accommodation-policy. Students who require an accommodation on a protected ground other than disability should communicate this need, preferably in writing, to their Instructor or the appropriate Associate Dean, Department Head or the department/faculty designated contact person.

Should a student write and hand in an examination for grading and later request the cancellation of the examination and a deferred examination or a retroactive withdrawal, such a request will be denied.

Students and instructors of record with courses with Registrar-scheduled final examinations must be available for the entire final examination period as outlined in the Academic Schedule.

See ucalgary.ca/registrar for additional final examination regulations.

G.4 Scheduling of Examinations

All final examinations must be scheduled by the Registrar, except:

- Final examinations which are take-home examinations, oral examinations or terminal projects.
- Final examinations in Law, Medicine (MD program only) and Veterinary Medicine, which are scheduled by each Faculty. The Faculty of Environmental Design also schedules its own final exams except for courses in the Architectural Studies minor.

Common mid-year tests in courses that run over more than one term must occur during the final examination period, and must be scheduled by the Registrar, except:

- Mid-year tests that are take-home or oral tests, or mid-term projects.
- Mid-year tests in Law, Medicine (MD program only) and Veterinary Medicine, which are scheduled by each Faculty. The Faculty of Environmental Design also schedules its own mid-year tests except for courses in the Architectural Studies minor.

In all Faculties, unscheduled examinations, assignments, tests, etc., may not be held by instructors after the last day of classes, i.e., during the study break or the examination period at the end of each term. Any such testing should be conducted by the instructor during the regular class periods before the end of a term. (See G.1 Scheduling of Tests for weighting of tests during the last 14 calendar days of the standard term.)

Requests for pre-assignment of examinations to special dates for whatever cause or reason will not be accommodated. Similarly, requests for changes to the dates of scheduled examinations will not be approved. Student votes and petitions to change a scheduled final examination will not be considered as these have been found to result in undue pressure on students not in agreement with an altered examination schedule.

The Examinations Timetable for Registrar-scheduled examinations will be published approximately one month after the start of the term and will be available via MyUofC in the online Student Centre and at the Enrolment Services website (ucalgary.ca/registrar).

G.5 Evening Credit and Campus Course Examinations

Final examinations in all courses, including evening credit courses, late afternoon courses and week-end courses are scheduled by the Registrar. The University cannot guarantee that examinations in evening credit courses will be scheduled in the evening but an effort is made to schedule as many examinations as possible in the evening. An examination common to both day and evening sections of a course may be scheduled during the day.

For courses offered at off-campus locations, the instructor will be responsible for scheduling the final examinations during the examination period at the end of the term.

G.6 Deferral of Final Examinations

Deferred examinations are allowed in the following circumstances: illness, domestic affliction and religious conviction. Students who submit a final examination for marking may not subsequently request a deferred final examination. Lack of writing a final examination does not guarantee approval of a deferred examination. Travel arrangements and misreading of the Examinations Timetable are not valid reasons for requesting a deferred examination.

The authority to grant or deny a deferred final examination is vested with the associate dean of the faculty in which the course is offered or Enrolment Services. The Application for Deferred Final Examinations form is available on the web (ucalgary.ca/registrar) and at Enrolment Services. Deferred final examinations will not be granted if it is determined that just cause is not shown by the student.

Students who have three final examinations within 24 hours will be allowed, at their request, to defer one examination to the deferred examination period.

If during the course of an examination a student becomes ill or receives word of domestic affliction, the student should report at once to the supervisor, hand in the unfinished paper and request that it be cancelled. If physical and/or emotional ill-health is the cause, the student must report at once to a physician/counsellor so that subsequent application for a deferred examination is supported by a completed Physician/Counsellor Statement form. Students can consult professionals at University Health Services or Counselling Services or consult their physician/counsellor in the community.

All requests for deferral of a final examination due to health reasons must be accompanied by a completed Physician/Counsellor Statement form. Letters from a physician/counsellor in lieu of a Physician/Counsellor Statement form will not be accepted. Students should be aware that there may be a charge for the medical assessment and documentation and they are responsible for the cost of this service.

In the event of an intended absence due to religious conviction, domestic affliction, or health reasons which makes it physically impossible to write an examination, an Application for Deferred Final Examinations form accompanied by written evidence must be submitted to the appropriate faculty office or Enrolment Services.

Students absent from a final examination due to unforeseen reasons must notify the appropriate faculty office or Enrolment Services no later than two business days after the missed final examination and apply for a deferred final exam as soon as they are able. Students who are eligible but do not apply for a deferred final examination by this

prescribed deadline will not be granted an approved deferred final examination.

Deferred final examinations are scheduled by the Registrar and a timetable will be made available on the web (ucalgary.ca/registrar) a week prior to the deferred examination period. Students writing a deferred final examination must consult this timetable to determine the exact date and time of their deferred examination.

A deferred final examination question paper will differ in content (to the extent possible) from the regular final examination and may not necessarily be of the same format as the regular final examination.

Students in their graduating year who write Winter Term deferred final examinations may not graduate until the following convocation ceremony in November.

Writing a deferred final examination may affect eligibility for certain undergraduate awards.

G.7 Deferral of Term Work

Instructors are normally free, subject to any established departmental or faculty procedures, to administer their own policies regarding deadlines for the completion of term papers or assignments. Students should be made fully aware of these policies on the course outline. However, should an extension of time be sought for completion of any such term work beyond five days after the end of lectures, a Deferral of Term Work form must be completed. Deferrals may only be granted at the discretion of the dean and will normally not exceed thirty days. Application forms are available at ucalgary.ca/registrar or at Enrolment Services.

See also section E.3 Attendance with regard to absences from tests.

G.8 Debarment

A student may be refused permission to write a final examination in a course, on the recommendation of the department concerned and with the concurrence of the dean of the faculty, in the following circumstances:

1. The student has neglected to do a substantial proportion of the written and/or laboratory assignments in a course of which these are an essential feature.

2. The student has not officially registered in the course.

G.9 Examination Results

Students may access their **final grades** via MyUofC using their online Student Centre. For requests for official transcripts, see F.9 Transcripts.

G.10 Final Examination Papers

After grading, final examination answer papers are forwarded to the faculty or department office and retained for a period of **one year** from the end of the month the final exam period was held in. During this period students may be able to view their graded final exam paper in the faculty/department office or obtain a photocopy of their graded paper at a cost determined by the faculty/department office.

G.11 Off-Site Examinations

Students are not permitted to write a University of Calgary final examination paper at an outside centre except under very special circumstances and with the permission of the associate dean of the faculty offering the course and the Registrar. This must be substantiated by a medical certificate or other acceptable verification. Students will be responsible for invigilation fees, if any, charged by external examination centres.

H. Graduation

H.1 Applying to Graduate

All undergraduate and graduate students who expect to receive a credential must complete an Application to Graduate (whether you are attending the convocation ceremony or not). The Application to Graduate is available through the Student Centre at my.ucalgary.ca. Deadlines to apply to graduate are available at ucalgary.ca/registrar.

There are three conferrals per year: Fall Convocation, Winter Conferral, and Spring Convocation.

Credential requirements completed	Eligible Conferral
By end of Summer Term	Fall Convocation
By end of Fall Term	Winter Conferral*
By end of Winter Term	Spring Convocation

**There is no graduation ceremony connected with the Winter Conferral; students are invited to attend the Spring Convocation ceremony.*

Students granted a letter of permission or approval for a deferred examination in the Winter Term of their graduating year are eligible to apply for Fall Convocation. Students are responsible for obtaining official transcripts and submitting them to the Office of the Registrar not later than one month before any conferral.

Students must be approved by their Faculty to be eligible to graduate and to participate in a convocation ceremony. Students who are not approved will be required to submit another Application to Graduate for a future conferral date.

H.2 Names on Parchment

The University only uses the legal name of a student on the parchment. Names are printed in upper case lettering in the following order: Given Name(s) and Surname. The use of an initial in place of a given name is not permitted. Any changes to the name currently on file with the Registrar's Office must be supported by government issued documentation. See section B.17 (Change of Personal Information) for more information.

H.3 Parchment Information

Minors, approved concentrations, and undergraduate specializations will not be indicated on parchments but will be noted on the official transcript.

H.4 Double Majors

Some degree programs permit a double major. Double major degrees will only be awarded if it is possible to obtain the degree with each of the majors. For example, a BA in Computer Science and History is permitted, whereas, a BSc in Computer Science and History would not be awarded since it is not possible to obtain a BSc in History.

H.5 Ceremony Attendance

Information regarding the convocation ceremony is available at ucalgary.ca/registrar. Graduands must notify the Convocation Office, by the deadline indicated in the Student Centre at my.ucalgary.ca, whether or not they will attend the ceremony. Seating is reserved only for those graduands who have notified the Convocation Office that they will be attending the ceremony.

Graduands who have indicated that they will not be attending the ceremony will have their degree mailed. A fee will apply.

H.6 Parchment Reprints

The University does not issue duplicate parchment; however, due to extraordinary circumstances, a replacement parchment may be issued. The Degree Reprint Form can be found online at: ucalgary.ca/registrar. The new parchment will be marked "duplicate" with the date it was reprinted. A fee will apply.

H.7 Posthumous Degrees

With the approval of the Registrar, a degree may be awarded posthumously to a deceased student who completed a degree program or was completing the last term of their degree program. Degrees granted posthumously will be noted on the transcript of record.

H.8 Convocation

Convocation ceremonies are held in Spring and Fall terms on campus. Please refer to the Academic Schedule for dates. Students can access graduation information online at ucalgary.ca/registrar.

H.9 Academic Dress

H.9.1 Hoods

Hoods are in accordance with the shape specified by the North American Intercollegiate Code for Bachelors', Masters', and Doctors' degrees. Faculty colours or colours of a specific discipline are:

Faculty of Arts - white*

BA - white

BCC - scarlet

BCS - silver grey

BFA - brown

BFS - scarlet

BMUS - pink

BSc - golden yellow

Cumming School of Medicine

BCR - dark green

BHSc - dark green

DPLMD - dark green

MD - dark green
Faculty of Environmental Design - russet
MArch - russet
MEDes - russet
MLA - russet
MPlan - russet
Faculty of Graduate Studies - philosophy blue*
LLM - purple
MA - white
MBA - sapphire blue
MBT - golden yellow
MC - light blue
MCE - light green
MCS - silver grey
MDCS - dark green
MEd - light blue
MEng & MSc in Eng - orange
MFA - brown
MGIS - golden yellow
MKin - sage green
MMus - pink
MN - apricot
MP - russet
MPP - turquoise
MSc - golden yellow
MSS - white
MSW - citron yellow
EdD - light blue
PhD - philosophy blue
BDipl - colour of discipline
MDipl - colour of discipline
PDipl - colour of discipline
Haskayne School of Business - sapphire blue
BComm - sapphire blue
BHRM - sapphire blue
Faculty of Kinesiology - sage green*
BKin - sage green
BSc - golden yellow
Faculty of Law - purple
Faculty of Nursing - apricot
Schulich School of Engineering - orange
BSc in Eng - orange
DipSc - orange
DipSH - orange
Faculty of Science - golden yellow*
BA - white
BSc - golden yellow
Faculty of Social Work - citron yellow
Faculty of Veterinary Medicine - grey*
DVM - asphalt
Werklund School of Education - light blue
BEd - light blue
DipEd - light blue

**The scarf colour of the dean of the faculty differs from hood colours for specific degrees.*

1. For the Bachelors' and Masters' degrees, the University of Calgary uses a black hood lined with the University colours, gold with red chevron, and trimmed with the colour indicating the subject of the degree, in a silk-like material. Those persons receiving Diplomas wear the bachelor's hood of the faculty offering the Diploma.

2. For the PhD hood, the body is doctors' scarlet, with a lining of gold and a chevron of scarlet with a three-inch trim at the edge (inside and out) of philosophy blue. The EdD hood conforms to the Intercollegiate Code in shape, size and colour. The trim colour is Education light blue.

3. For Honorary Doctorates of the University of Calgary (LLD) the hoods have a body in gold, lined in doctors' scarlet with a gold chevron. The trim is a one-inch band of white silk edged with a three-inch band of scarlet velvet, the configuration follows that of the PhD hood.

4. The honorary degree Doctor of the University of Calgary (DUC) has been awarded previously. The hood is similar to the LLD hood without the white band.

H.9.2 Headwear

1. The headwear for Bachelors' and Masters' is the black mortarboard or trencher-type hat.

2. For Doctors', the headwear is a black velvet John Knox cap or birretum.

H.9.3 Gowns

1. Bachelors' and Masters' gowns follow the black gown specified by the North American Intercollegiate Code.

2. Doctorate gowns (PhD) are doctors' scarlet in colour with a gold yoke. The silk trim on the sleeves and front panels is of blue silk. Doctorate gowns (EdD) conform to the Intercollegiate Code in design. The normal gown for the EdD is the black gown with light blue bars on the arm.

3. Honorary Doctorate gowns are gold with a red velvet yoke. Trim on inside and outside of sleeves and the front panels is red velvet.

H.9.4 Deans' and Vice-Presidents' Scarves

The academic deans have scarves in the appropriate faculty colour with an embroidered University coat-of-arms, approximately two and one half by three and one half inches, on the left side. The vice-presidents' scarves are of the scarlet used in the president's gown and trimmed around the edges with the same silver braid.

H.10 Official Degrees/Diplomas/Certificates

- Faculty of Arts
  - Bachelor of Arts (BA)
  - Bachelor of Arts (Honours)
  - Bachelor of Communication and Culture (BCC)
  - Bachelor of Communication and Media Studies (BCMS)
  - Bachelor of Communications Studies (BCS)
  - Bachelor of Film Studies (BFS)
  - Bachelor of Fine Arts (BFA)
  - Bachelor of Fine Arts (Honours)
  - Bachelor of Music (BMus)
  - Bachelor of Science (BSc)
  - Bachelor of Science (Honours)
- Cumming School of Medicine
  - Bachelor of Community Rehabilitation (BCR)
  - Bachelor of Health Sciences (BHSc) (Honours)
  - Diploma of the Faculty of Medicine (DPLMD)
  - Doctor of Medicine (MD)
- Faculty of Environmental Design
  - Master of Architecture (MArch)
  - Master of Environmental Design (MEDes)
  - Master of Planning (MPlan)
- Faculty of Graduate Studies
  - Master of Arts (MA)
  - Master of Biomedical Technology (MBT)
  - Master of Business Administration (MBA)
  - Master of Communications Studies (MCS)
  - Master of Counselling (MC)
  - Master of Education (MEd)
  - Master of Engineering (MEng)
  - Master of Fine Arts (MFA)
  - Master of Geographic Information Systems (MGIS)
  - Master of Kinesiology (MKin)
  - Master of Laws (LLM)
  - Master of Music (MMus)
  - Master of Nursing (MN)
  - Master of Public Policy (MPP)
  - Master of Science (MSc)
  - Master of Science in Biomedical Engineering (MSc)
  - Master of Science in Chemical Engineering (MSc)
  - Master of Science in Civil Engineering (MSc)
  - Master of Science in Electrical Engineering (MSc)
  - Master of Science in Geomatics Engineering (MSc)
  - Master of Science in Mechanical Engineering (MSc)
  - Master of Social Work (MSW)
  - Master of Strategic Studies (MSS)
  - Nurse Practitioner Certificate (NP)
  - Post-Baccalaureate Certificate
  - Post-Bachelor Certificate
  - Post-Master Certificate
  - Post-Doctoral Certificate
  - Graduate Diploma (BDipl)
  - Post-Doctoral Diploma (PDipl)
  - Post-Master's Diploma (MDipl)
  - Doctor of Education (EdD)
  - Doctor of Philosophy (PhD)

- Haskayne School of Business
  - Bachelor of Commerce (BComm)
  - Bachelor of Hotel and Resort Management (BHRM)
- Faculty of Kinesiology
  - Bachelor of Kinesiology (BKin)
  - Bachelor of Kinesiology (Honours)
  - Bachelor of Science (BSc)
  - Bachelor of Science (Honours)
- Faculty of Law
  - Juris Doctor (JD)
- Faculty of Nursing
  - Bachelor of Nursing (BN)
- Schulich School of Engineering
  - Bachelor of Science in Chemical Engineering (BSc)
  - Bachelor of Science in Civil Engineering (BSc)
  - Bachelor of Science in Computer Engineering (BSc)
  - Bachelor of Science in Electrical Engineering (BSc)
  - Bachelor of Science in Energy Engineering (BSc)
  - Bachelor of Science in Geomatics Engineering (BSc)
  - Bachelor of Science in Manufacturing Engineering (BSc)
  - Bachelor of Science in Mechanical Engineering (BSc)
  - Bachelor of Science in Oil and Gas Engineering (BSc)
  - Bachelor of Science in Software Engineering (BSc)
  - Diploma of the Schulich School of Engineering (DipSc)
  - Diploma of the Schulich School of Engineering and the Haskayne School of Business (DipSH)
- Faculty of Science
  - Bachelor of Arts (BA)
  - Bachelor of Arts (Honours)
  - Bachelor of Science (BSc)
  - Bachelor of Science (Honours)
- Faculty of Social Work
  - Bachelor of Social Work (BSW)
- Faculty of Veterinary Medicine
  - Doctor of Veterinary Medicine (DVM)
- Werklund School of Education
  - Bachelor of Education (BEd)
  - Diploma of the Faculty of Education (DipEd)

H.11 Honorary Degrees

The Senate of the University of Calgary is responsible for selecting individuals to receive the University's highest academic honour - the Honorary Doctor of Laws (LLD). Honorary degrees are conferred by the Chancellor to recognize extraordinary achievement in community, national or international service and to honour those individuals whose accomplishments are of such excellence that they provide, through example, inspiration and leadership to the graduates of the University. Contributions may have been made in any field, including the arts, business, the professions, scholarly endeavours and voluntary activities. Normally excluded from consideration are those currently holding elected office, as well as current members of the University community. For more information, contact senate@ucalgary.ca or telephone 403.220.6581.

H.12 The Order of the University of Calgary

The Order of the University of Calgary is a prestigious University award recognizing exemplary and distinguished service to the University. The award is available to any member of the University community, those currently or formerly attached to the University and to those representing the University in the community. Candidates nominated for membership in the Order may include, but are not limited to faculty, staff, students (graduate or undergraduate), volunteers and alumni. For more information, contact senate@ucalgary.ca or telephone 403.220.6581.

I. Reappraisal of Grades and Non-Disciplinary Academic Appeals

The University acknowledges that there are instances when a student may wish to challenge University decisions about grades or academic policy. The following guidelines and procedures deal with those occasions. Please note that graduate students should refer to the Faculty of Graduate Studies Calendar.

I.1 General Principles

1. Students should recognize that reappraisals of term and final grades occur at the department/faculty level that originated those decisions.

2. Students should recognize that appeals of grade reappraisals and other academic decisions will be handled at the level of appeal closest to the level at which the decision was made.

3. Students must begin the reappraisal/appeal process at the appropriate level and proceed through successive levels of appeal in order, and with no omissions.

4. At every level, students should attempt, to the utmost of their ability, to present their arguments as effectively and as fully as possible. Mere dissatisfaction with a decision is not sufficient grounds for the appeal of a grade or other academic decision.

5. The General Faculties Council's (GFC) Student Academic Appeals Committee will hear all appeals relating to academic misconduct. The GFC Student Academic Appeals Committee will hear reappraisal of grades and other academic appeals only if it can be demonstrated that there is (a) alleged bias, and/or (b) alleged unfair procedures at a lower level of appeal, and/or (c) substantial new evidence which could not have been presented at an earlier stage.

6. Students may obtain help in understanding the appeals process and in writing appeal letters from the Student Ombuds Office. For more information, refer to their website: ucalgary.ca/provost/students/ombuds.

Students who wish to apply for a reappraisal of graded term work or final grades, or wish to appeal those reappraisals, and students who wish to appeal what they feel are unfair academic decisions by their faculty should follow the guidelines stated below.

I.2 Reappraisal of Graded Term Work

A student who feels that a piece of graded term work (term paper, essay, test, etc.) has been unfairly graded, may have the paper re-graded as follows. The student shall discuss the work with the instructor **within fifteen days** of being notified about the mark or of the item's return to the class. If not satisfied, the student shall **immediately** take the matter to the head of the department offering the course who will arrange for a reassessment of the work **within the next fifteen days.** Students in faculties without a departmental structure should take the matter to the dean or the associate/assistant dean (Academic/Student Affairs) of the faculty offering the course. The result of that reassessment should be given to the student in writing.

The reappraisal of term work may cause the grade to be raised, lowered or to remain the same. There is no limit to the number of times that a student may request a reappraisal of term work.

I.2.1 Non-Disciplinary Appeals - Faculty Appeals Committee

Reappraisal of term work is generally settled at the departmental level. If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the dean of the faculty offering the course **within fifteen days** of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal and the remedies being sought, along with any special circumstances which warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

At this stage the dean, at the dean's discretion, may attempt to resolve the situation without proceeding to the Faculty Appeals Committee. If the matter is not resolved to the student's satisfaction, the appeal letter will be sent to the Faculty Appeals Committee.

The Faculty Appeals Committee will not hear the appeal if the appeal letter does not detail the decision being appealed, grounds for appeal and outcome sought by the student, or if the chair of the Faculty Appeals Committee decides that sufficient grounds do not exist. If the appeal is to be heard and if the student has not already received a copy, the student is advised to request from the dean's office, a copy of the principles

and procedures that govern the Faculty Appeals Committee for that faculty. These procedures will detail the composition of the committee, the right of the student to have an advocate at the hearing, how the hearing will be conducted, and other information.

The Faculty Appeals Committee will report its decision to uphold or deny the appeal in writing to the dean of the faculty, the Registrar and the appellant as quickly as possible.

I.2.2 Appeals - General Faculties Council's Student Academic Appeals Committee

This committee hears appeals of decisions made by Faculty Appeals Committees on matters of academic concern to students. The General Faculties Council's Committee will hear an appeal only if there is reason to believe that the Faculty Appeals Committee showed alleged bias, followed alleged unfair procedures, and/or if there is substantial new evidence which could not have been presented to a Faculty Appeals Committee. Grades obtained in courses completed by the student in the appeals process will not be considered as new evidence. Before the General Faculties Council's Committee will accept an appeal, the chair of that committee must be satisfied that departmental and faculty appeals procedures have been fully utilized.

Students wishing to make an appeal to the GFC Student Academic Appeals Committee must do so **within fifteen days** of the unfavourable decision from the Faculty Appeals Committee. A letter of appeal shall be sent to the General Faculties Council's Committee (Administration Building room 165), and must indicate the decision being appealed, the grounds for appeal (alleged bias, alleged unfair procedures and/or substantial new information) and the remedies sought by the student, together with all supporting documentation including copies of letters demonstrating the levels of appeal that have already been utilized.

The General Faculties Council's Committee will not hear the appeal if the chair decides that sufficient grounds do not exist.

A student whose appeal is to be heard by the General Faculties Council's Committee is entitled to obtain from the Secretary to General Faculties Council the principles and procedures governing the General Faculties Council's Committee. These procedures will detail the composition of the committee, the right of the student to have an assistant, how the hearing will be conducted and other information. The principles and procedures are also available on the University Secretariat website: ucalgary.ca/secretariat.

The committee will normally give **fifteen days** written notice of a hearing to the appellant and to the head of the academic unit against whose office the appeal is being made. Normally, the General Faculties Council's Committee will hear an appeal **within thirty days** of its acceptance. The chairperson of the General Faculties Council's Committee will convey the committee's findings in writing to the appellant, the respondent, the Secretary to General Faculties Council and the Registrar.

For more specific information and other principles governing student academic appeals, the Secretary to General Faculties Council should be consulted.

I.3 Reappraisal of Final Grade

In the reappraisal of a final grade, the only elements that will be considered are the grading of the final examination, if any, together with a recalculation of the weighted components that make up the final mark. An exception may occur when an instructor evaluates a piece of graded term work or other component at the end of the term; that grade may also be considered in a reappraisal of final grade.

A student wishing a reappraisal of an individual final grade should first attempt to examine the final examination at the department or faculty office. Then the student shall obtain a Reappraisal of Final Grade form from Enrolment Services. On that form the student is required to indicate exactly what error was made in marking the examination and/or in computing the final grade. The form will not be processed and the reappraisal will not take place unless the student provides a detailed rationale that outlines where and for what reason an error is suspected.

Students wishing a reappraisal of a final grade (excluding Law courses) must submit their request by the following dates: Fall Term - March 1, Winter Term - June 30, Spring Intersession - August 15, Summer Term - October 15.

The reappraisal form shall be submitted to Enrolment Services who shall forward it to the department head or dean of the faculty offering the course. Reappraisals of final grades are dealt with by the head of the academic unit in consultation with members of staff. Normally, the department/faculty will respond to a Request for Reappraisal of Final Grade **within thirty days** of its initiation. After the reappraisal is completed, the department shall return the form to the Registrar who shall inform the student in writing of the result of any request for reappraisal.

Students should be aware that the grade being reappraised may be raised, lowered or remain the same. A student may request a reappraisal of final grade only twice in one academic year (September 1 – August 31).

I.3.1 Appeals - Faculty Appeals Committee

Procedures for appealing a final grade reappraisal beyond the departmental level are detailed in I.2.1 Non-Disciplinary Appeals - Faculty Appeals Committee, and are the same for a final grade as for a piece of graded term work.

I.3.2 Appeals - General Faculties Council's Student Academic Appeals Committee.

Procedures for appealing a final grade reappraisal beyond the Faculty Appeals Committee level are detailed in I.2.2 Appeals - General Faculties Council's Student Academic Appeals Committee, and are the same for a final grade as for a piece of graded term work.

I.4 Other Academic Appeals

If a student wishes to appeal a faculty ruling on an academic matter (i.e., the requirement to withdraw from a faculty for academic reasons, the denial of continued registration, the denial of the right to graduate, specific requirements by the faculty for the completion of a degree/course of study), the student shall address a letter of appeal to the dean of the student's registered faculty **within fifteen days** of the unfavourable decision.

In the letter of appeal, the student must clearly and fully state the ruling/decision being appealed, the grounds for appeal and the remedies being sought, together with all supporting evidence or documentation, if any. Mere dissatisfaction with a ruling is not sufficient grounds for an appeal.

At this stage the dean, at the dean's discretion, may attempt to resolve the situation inside the faculty, without proceeding to the Faculty Appeals Committee. If the matter is not resolved to the student's satisfaction, the appeal letter will be sent to the Faculty Appeals Committee.

The dean will forward the letter to the chair of the Faculty Appeals Committee for consideration. If the appeal letter does not detail the decision being appealed, the grounds for appeal and the outcome sought by the student, or if the chair of the Faculty Appeals Committee decides that sufficient grounds do not exist, the appeal will not be heard. If the appeal is to be heard, and the student has not already received a copy, the student is advised to request from the dean's office, a copy of the principles and procedures that govern the Faculty Appeals Committee for that faculty. These procedures will detail the composition of the committee, the right of the student to have an advocate at the hearing, how the hearing will be conducted, and other information.

The Faculty Appeals Committee shall report its decision to uphold or deny the appeal, in writing to the dean of the faculty, the Registrar and the appellant as quickly as possible.

I.4.1 General Faculties Council's Student Academic Appeals Committee

This committee hears appeals of decisions made by Faculty Appeals Committees on matters of academic concern to students. The General Faculties Council's Committee will hear an appeal only if there is reason to believe that the Faculty Appeals Committee showed alleged bias, alleged unfair procedures, and/or if there is substantial new evidence which could not have been presented to a Faculty Appeals Committee. Grades obtained in courses completed by the student in the appeals process will not be considered as new evidence. Before the General Faculties Council's Committee will accept an appeal, the chair of that committee must be satisfied that departmental and

faculty appeals procedures have been fully utilized.

Students wishing to make an appeal to the GFC Student Academic Appeals Committee must do so **within fifteen days** of the unfavourable decision from the Faculty Appeals Committee. A letter of appeal should be sent to the General Faculties Council's Committee(Administration Building room 165), and must indicate the decision being appealed, the grounds for appeal (alleged bias, alleged unfair procedures, and/or substantial new information), and the remedies being sought by the student, together with all supporting documentation including copies of letters demonstrating the levels of appeal that have already been utilized.

The General Faculties Council's Committee will not hear the appeal if the chair decides that sufficient grounds do not exist.

A student whose appeal is to be heard by the General Faculties Council's Committee is entitled to obtain from the Secretary to General Faculties Council the principles and procedures governing the General Faculties Council's Committee. These procedures will detail the composition of the committee, the right of the student to have an assistant, how the hearing will be conducted and other information. The principles and procedures are also available on the University Secretariat website: ucalgary.ca/secretariat.

The committee will normally give **fifteen days** written notice of a hearing to the appellant and to the head of the academic unit against whose office the appeal is being made. Normally, the General Faculties Council's Committee will hear an appeal **within thirty days** of its acceptance. The chair of the General Faculties Council's Committee will convey the committee's findings in writing to the appellant, the respondent, the Secretary to General Faculties Council and the Registrar.

For more specific information and other principles governing student academic appeals, the Secretary to General Faculties Council should be consulted.

I.5 Further Information About Other Appeals and Petitions to the University

It is expected that the procedures outlined above for appeals at the Faculties Council and General Faculties Council levels will be sufficient to deal with any student appeal. Students should note, that, except for cases of student discipline, as provided under Section 31(1) (a) of the Post-Secondary Learning Act, the Board of Governors does not have jurisdiction to act as an appellate body in any other matter and, specifically, there is no right to appeal a decision of General Faculties Council to the Board of Governors under the Act. Discipline, as it relates to Section 31(1) of the Act, means only academic or non-academic misconduct as defined by this Calendar and University Policy and determined by General Faculties Council.

Section 31(1)(a) of the Act states:

The general faculties council has general supervision of student affairs at a university and in particular, but without restricting the generality of the foregoing, the general faculties council may

(a) subject to a right of appeal to the board, discipline students attending the University, and the power to discipline includes the power

(i) to fine students,

(ii) to suspend the right of students to attend the University or to participate in any student activities, or both, and

(iii) to expel students from the University.

The Board of Governors has approved principles and guidelines for its Student Discipline Appeal Committee to use in the consideration of discipline appeals submitted by students in accordance with the Post-Secondary Learning Act. The Student Discipline Appeal Committee is not a court of law and must not be assumed to have or exercise such authority. The decisions of the Student Discipline Appeal Committee shall be deemed to be decisions of the Board and are final and binding upon the Board.

When submitting an appeal to the Board of Governors, the appellant should ensure:

The appeal is delivered to the Secretary to the Board of Governors within fifteen calendar days of the GFC decision, in accordance with Section 31(1) of the Act, unless otherwise extended by the Secretary to the Board in absolute discretion.

The appeal should include:

- Any grounds of appeal
- Supporting evidence
- A statement of remedy sought
- The GFC student discipline appeal decision being appealed with respect to the case
- All relevant documents

On the call of the Chair, the Student Discipline Appeal Committee shall meet to consider and determine the appeal based on the documentary evidence submitted, and to choose from the three remedies available in the decision-making process:

- To refer the issue back to the level of the appropriate jurisdiction for a re-hearing and a new determination of the question. In referring the issue back, the Chair will provide appropriate instructions to rectify any procedural errors; such instructions may include a reconstitution of the Committee hearing the issue.
- To uphold the appeal or a part thereof. This decision would be made when consideration of the GFC decision warrants a reversal of the decision appealed or a part thereof.
- To deny the appeal in whole or in part.

In the case of an appeal challenging a decision of the University body on procedural grounds such as breaches of natural justice or fairness, the Student Discipline Appeal Committee will normally refer the issue back to the level of appropriate jurisdiction for a rehearing and new determination of the question. In the case of an appeal challenging a decision in which the student is denied permission to register, the student shall not be registered while the appeal is before the Board.

For more specific information on the principles and procedures governing student discipline appeals to the Board of Governors, the University Secretariat should be consulted.

Further information is also available on the University Secretariat website: ucalgary.ca/secretariat.

I.6 Continued Registration While Under Appeal

Most students who appeal academic decisions shall be entitled to tentative registration to continue studies pending the outcome of the appeal. The student must contact the Registrar of the University to register while under appeal. All decisions with regard to an appeal shall be communicated immediately to the Registrar. The student is required to pay all fees. If the appeal fails, the original date of suspension, expulsion or other academic sanction shall pertain and, in the case of suspension or expulsion, the student must immediately discontinue attendance of classes; the student's registration will be cancelled, regardless of the date, and all fees refunded in full. If the appeal is upheld, the student will be officially registered retroactively. Students appealing to the Board of Governors are not permitted to register while under appeal.

J. Statement on Principles of Conduct

J.1 Preamble

This statement applies to all members of the University community - including students, faculty, administrators, any category of staff, practicum supervisors, examiners, and volunteers. This statement applies in all situations where the persons are acting in their University capacities, whether or not on the University's property. It also applies to visitors or any other persons on University property, and to persons with whom the University contracts for services.

All members of the University community have a responsibility to familiarize themselves with this Statement on Principles of Conduct and to conduct themselves accordingly.

J.2 Statement

1. The University of Calgary community has undertaken to be guided by the following statements of purpose and values:

- To promote free inquiry and debate
- To act as a community of scholars
- To lead and inspire societal development
- To respect, appreciate, and encourage diversity
- To display care and concern for community

2. The University seeks to create and maintain a positive and productive learning and

working environment, that is, an environment in which there is:

- Respect for the dignity of all persons
- Fair and equitable treatment of individuals in our diverse community
- Personal integrity and trustworthiness
- Respect for academic freedom
- Respect for personal and University property

3. Those persons appointed by the University to positions of leadership and authority have particular responsibility, not only for their own conduct, but also for ensuring, to the extent of their authority and ability:

- That a positive and productive learning and working environment is created and maintained
- That conflicts and concerns are addressed in a positive, timely, reasonable, and effective manner
- That persons within their jurisdiction are informed of their rights and responsibilities with respect to conduct

4. The University undertakes to ensure that its policies, systems, processes, and day-to-day operations foster the goals in #1 and #2 above.

5. The University encourages and undertakes to support all members of the University community in resolving conflicts and concerns in a positive, timely, reasonable, and effective manner.

6. The University undertakes to ensure that the protection afforded by the principles of natural justice is extended to all members of the University community.

7. The University undertakes to provide resources through various offices to generate awareness related to this Statement on Principles of Conduct throughout the University community and to assist in resolving conflict in a positive way.

Note: The principles of natural justice reflect a concept that ensures fair play. The specific requirements of natural justice will often vary depending on the circumstances but are generally considered to ensure a full and fair consideration of the issue, including consideration in the absence of bias.

K. Student Misconduct

A single offence of cheating, plagiarism, or other academic misconduct, on term work, tests, or final examinations, etc., may lead to disciplinary probation or a student's suspension or expulsion from the faculty by the dean, if it is determined that the offence warrants such action. A student is defined as any person registered at the University for credit or non-credit courses. Please note that graduate students should refer to the Faculty of Graduate Studies Calendar.

K.1 Statement of Intellectual Honesty

Intellectual honesty is the cornerstone of the development and acquisition of knowledge. Knowledge is cumulative and further advances are predicated on the contributions of others. In the normal course of scholarship these contributions are apprehended, critically evaluated, and utilised as a foundation for further inquiry. Intellectual honesty demands that the contribution of others be acknowledged. To do less is to cheat. To pass off contributions and ideas of another as one's own is to deprive oneself of the opportunity and challenge to learn and to participate in the scholarly process of acquisition and development of knowledge. Not only will the cheater or intellectually dishonest individual be ultimately their own victim but also the general quality of scholarly activity will be seriously undermined. It is for these reasons that the University insists on intellectual honesty in scholarship. The control of intellectual dishonesty begins with the individual's recognition of standards of honesty expected generally and compliance with those expectations. With respect to student work in a course, it is the responsibility of the instructor to specify the academic requirements of the course.

K.2 Plagiarism/Cheating/Other Academic Misconduct

K.2.1 Definitions

1. **Plagiarism** - Plagiarism involves submitting or presenting work as if it were the student's own work when it is not. Any ideas or materials taken from another source written, electronic, or oral must be fully and formally acknowledged. Plagiarism includes but is not limited to:

(a) The work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),

(b) Parts of the work are taken from another source without reference to the original author,

(c) The whole work (e.g., an essay) is copied from another source, and/or,

(d) A student submits or presents work in one course which has also been submitted in another course (although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved.

While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence.

It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by them in a thesis or dissertation.

2. **Cheating** is an extremely serious academic offence. Cheating at tests or examinations includes but is not limited to dishonest or attempted dishonest conduct such as speaking to other candidates or communicating with them under any circumstances whatsoever; bringing into the examination room any textbook, notebook, memorandum, other written material or mechanical or electronic device not authorized by the examiner; writing an examination or part of it, or consulting any person or materials outside the confines of the examination room without permission to do so, or leaving answer papers exposed to view, or persistent attempts to read other students' examination papers.

3. **Other Academic Misconduct** - Other academic misconduct includes, but is not limited to, tampering or attempts to tamper with examination scripts, class work, grades and/or class records; failure to abide by directions by an instructor regarding the individuality of work handed in; the acquisition, attempted acquisition, possession, and/or distribution of examination materials or information not authorized by the instructor; the impersonation of another student in an examination or other class assignment; the falsification or fabrication of clinical or laboratory reports; the non-authorized tape recording of lectures.

4. Any student who voluntarily and consciously aids another student in the commission of one of these offences is also guilty of academic misconduct.

K.2.2 Penalties

1. **Failing Grade** - A student may be given a failing grade in either an exercise or course in which that student is found guilty of plagiarism, cheating or other academic misconduct. Except in circumstances in which leniency is warranted, this penalty will only be applied in conjunction with one or other of the other penalties mentioned in this section. In situations in which a student is registered in a faculty other than that in which the course is given, this is the only penalty which shall be applied by the host faculty. A student may not avoid a failing grade by withdrawing from the course.

2. **Disciplinary Probation** - When a student is placed on disciplinary probation, they are entitled to proceed with a degree or other academic program, but only on condition that the registration will be forfeited and the student suspended or expelled, if they are found guilty of a further academic offence. A student who is placed on disciplinary probation is eligible to continue in the faculty in the normal way after the satisfactory completion of their probationary period. This penalty shall be applied by the faculty in which the student is registered at the time of the offence.

3. **Suspension** - Suspension takes place when a student is denied registration within a degree or other academic program for a specified period of time. A student who has been placed under suspension is conditionally eligible to reapply for admission or registration at either the end of a specified period of time or thereafter. Suspension does not imply automatic readmission; a student must satisfy the dean and/or the faculty concerned of their eligibility for readmission. This penalty shall be applied by the faculty in which the student is registered at the time of the offence.

4. **Expulsion** - A student who is expelled from a faculty is dismissed permanently from the faculty with no right to apply for readmission to that faculty. This penalty shall be applied by the faculty in which the student is registered at the time of the offence.

5. **Effects of Suspension or Expulsion from a Faculty** - A student suspended or expelled from a faculty normally may not apply or be considered for readmission to the University in another faculty, until at least twelve months after the end of the session in which the academic offence takes place.

6. **Expulsion from the University** - If, upon suspending or expelling a student from a faculty, the dean and/or faculty determine that the severe sanction of expulsion from the University is warranted, such a recommendation may be made to the Vice-President (Academic), who may act to expel the student from the University.

K.2.3 Penalties and their Application

1. In cases in which the dean and/or faculty is satisfied that a student is guilty of plagiarism, cheating or other academic misconduct in circumstances which suggest a clear intention to deceive or otherwise commit an academic offence, the normal penalty will be either suspension or expulsion from the faculty.

2. In cases in which the dean and/or faculty is satisfied that an offence has been committed, but doubt is left as to the existence of a clear intention to deceive or otherwise commit an academic offence, the normal penalty will be probation.

3. In cases where a student is found guilty of more than a single offence, the normal penalty will be expulsion from the faculty, and in the most serious cases, expulsion from the University.

K.2.4 Procedures

1. Identification of Students in Tests or Examinations - Invigilators of any tests or examinations may, when they have reason to believe that there is cause to do so, challenge any candidate to produce proof of identity either in the form of the University I.D. card or of some acceptable equivalent (i.e., one bearing a photograph) such as the Provincial Drivers License, Canadian Citizenship Card, Passport, etc.

If there is clear evidence that impersonation has occurred, the individual shall not be permitted to continue the examination and shall be reported immediately to the dean of the faculty in which the course is offered or a delegate.

A student who is not able to provide acceptable proof of identity may be permitted to continue the examination provided that they undertake to provide verification of identity later. If verification is not provided, then the student will receive an "F" in the examination, and the matter will be referred to the dean of the faculty in which the course is offered or a delegate for consideration of further disciplinary action.

2. The Responsibility of Instructors in Cases of Plagiarism, Cheating and Other Academic Misconduct - An instructor has the obligation to report immediately all suspected cases of plagiarism, cheating or other academic misconduct in their course or courses to the dean of their faculty, or a delegate, and to the head of department or equivalent.

3. The Encouragement of the Reporting of Plagiarism, Cheating or Other Academic Misconduct - Students or other persons who consider that they have evidence of conduct which amounts to plagiarism, cheating or other academic misconduct are encouraged to report such conduct to the dean of the relevant faculty or a delegate. An individual or group of individuals making such a report must be prepared to state the alleged facts and their reasons for suspicion in writing, and to appear before the dean, a delegate, the appropriate faculty disciplinary body, the Faculty Appeals Committee and the General Faculties Council's Committee to Hear and Determine Student Academic Appeals.

4. The Responsibility of the Dean of the Faculty in Which the Course is Offered - The initial responsibility for dealing with cases of plagiarism, cheating or other academic misconduct, lies with the dean of the faculty offering the course in which the student is enrolled or a delegate, subject to structures for advice, recommendation or action devised by that faculty. Where the student is registered in that particular faculty, any disciplinary action taken will normally not be of concern to any other faculty.

5. The Relative Responsibilities of the Faculty in Which a Student Takes a Course and the Faculty in Which They are Registered at the Time of the Offence - In cases in which a student who is accused of plagiarism, cheating or other academic misconduct is registered in a faculty other than that in which the course is given, the dean of the faculty in which they are registered shall be advised of the incident, its circumstances, and its disposition within the host faculty, and where appropriate shall take disciplinary action within their own faculty subject to structures for advice, recommendation or action devised by that faculty. This notification shall be the responsibility of the dean of the host faculty, or a delegate.

6. The Disposition of Cases by the Faculty in Which a Student is Registered at the Time of the Offence - In alleged cases of plagiarism, cheating or other academic misconduct the dean or a delegate after advising the student of the allegation and its basis and providing them with copies of any documentary evidence supporting the allegation shall interview both the instructor and the student concerned. Where they are satisfied that there is conclusive evidence that the student has committed an offence, the dean or a delegate shall, subject to any structures for advice, recommendation or action devised by that faculty, exercise authority to place on probation, suspend or expel the student from the faculty in question. The probation, suspension or expulsion will be confirmed in writing to the student at their current address, the letter to include reference to faculty and University appeal procedures. In cases in which the student has admitted the offence reference shall be made to this fact in the letter.

The Registrar will be notified of the action taken. Upon receiving notification the Registrar is empowered to withhold the issuance of a transcript or statement of grades for the student disciplined pending the expiry of the appeal period, or exhaustion of the appeal process allowed for under K.2.6 Appeals.

K.2.5 Academic Misconduct - Criminal Offence

Where there is a criminal act involved in plagiarism, cheating or other academic misconduct, e.g., theft (taking another student's paper from their possession, or from the possession of a faculty member without permission), breaking and entering (forcibly entering an office to gain access to papers, grades or records), forgery, personation and conspiracy (impersonating another student by agreement and writing their paper) and other such offences under the Criminal Code of Canada, the University may take legal advice on the appropriate response and, where appropriate, refer the matter to the police, in addition to or in substitution for any action taken under these regulations by the University.

K.2.6 Appeals

1. Every faculty shall be required to have a Faculty Appeals Committee.

2. The Appeals Process - The student who is assessed an "F" grade for disciplinary reasons, placed on probation, suspended or expelled from a faculty, may appeal that decision to the appropriate Faculty Appeals Committee. The appeal, which must be initiated within fifteen days of the receipt of the letter from the dean or a delegate, shall be in writing, addressed to the chairperson of the appropriate committee, and shall state specifically (a) the decision which is being appealed, (b) the grounds for the appeal, (c) the remedy being sought. The appropriate Faculty Appeals Committee in the case of appeal of a grade is that of the faculty in which the course is offered. In the case of disciplinary probation, suspension or expulsion, it is that of the faculty in which the student is registered.

A student must satisfy the Appeals Committee that there are sufficient grounds for appeal. The principles applicable to an appeal to a Faculty Committee are those of fairness as set down in relation to the Committee to Hear and Determine Student Academic Appeals of General Faculties Council which are filed with the Secretary to General Faculties Council. It is recognized that the specific procedures used to attain fairness may vary from one faculty to another.

3. Appeal from a Faculty Appeals Committee - Where a student is unsuccessful in an appeal to a Faculty Appeals Committee, they may appeal that decision to the Committee to Hear and Determine Student Academic Appeals of General Faculties Council, subject to the principles and procedures of the General Faculties Council's Committee as approved by General Faculties Council and

filed with the Secretary to General Faculties Council.

4. Notification to the Registrar - When an appeal has been lodged by a student, the Registrar shall be notified by the chairperson of the Faculty Appeals Committee or General Faculties Council's Committee, as the case may be, of that fact, and of the disposition of the case by that body.

5. The Position of a Student Launching an Appeal Against Suspension or Expulsion - Where a student's appeal against suspension or expulsion is accepted for hearing and is under consideration by an appeals committee, a student shall be granted tentative registration and permitted to attend classes. If the appeal succeeds, the student will be officially registered retroactively to the beginning of the session.

6. The Position of a Student Whose Appeal Against Suspension or Expulsion is Unsuccessful - In cases in which the student has been allowed to attend classes pending the disposition of an appeal and the appeal fails, the original date of the suspension or expulsion pertains. All relevant fees will be refunded in full.

7. The Effect on a Student's Permanent Record - Where a student has been suspended, expelled or placed on disciplinary probation and does not launch an appeal within fifteen days, or the appeal is unsuccessful, the notation "suspended or expelled from or placed on disciplinary probation by the Faculty of _____, for academic misconduct" will be entered on the student's permanent record upon receipt of such notice by the Registrar from the dean of the faculty.

Where a student is suspended or expelled prior to the completion of the session, the symbols RW (required to withdraw) will be entered in the grade column on the student's record in the courses in which they were registered for that session except for the course(s) in which an "F" grade has been given as a penalty. Where a student is suspended or expelled after the completion of a session the final grade will be entered on the student's record in the courses in which they were registered for that session except for the course(s) in which an "F" grade has been given as a penalty.

A student's record will be cleared of the notation "placed on disciplinary probation for academic misconduct" when the probationary period has been completed, or upon completion of a degree program in another faculty, or after three years have elapsed, whichever comes first. A student's record will be cleared of the notation "suspended for academic misconduct" at the time of readmission to the same faculty, upon readmission to and completion of a degree program in another faculty, or after three years have elapsed, whichever comes first. At the time the record is cleared of the notation, the RW symbols will be changed to W, but any "F" grades, as given because of plagiarism, cheating or other academic misconduct, will remain "F"s. **A student's record will not be cleared of the notation "expelled for academic misconduct."** These regulations also apply to students on probation, suspension or expulsion for non-academic misconduct.

K.3 Disciplinary Action for Non-Academic Misconduct

On December 11, 2014 the General Faculties Council approved a Student Non-Academic Misconduct Policy and Procedure. All non-academic misconduct will be managed under this policy effective January 1, 2015. The current policy may be found at: ucalgary.ca/conduct/misconduct.

L. Integrity in Scholarly Activity

In addition to its regulations dealing with student academic misconduct, the University has a policy and procedures governing the scholarly integrity of members of the University's faculty and persons holding postdoctoral fellowships or their equivalent. The policy and procedures are titled Integrity in Scholarly Activity and apply to both teaching and research.

L.1 Policy

The University and its members are committed both institutionally and individually to integrity in scholarly activity. Accordingly, the University has developed and implemented a policy and attendant procedures for handling cases of alleged scholarly misconduct. These are designed to recognize the differences among disciplines, to provide for fair treatment of those whose integrity is brought into question, and to protect those who set the process in motion or otherwise assist in dealing with complaints.

L.2 Scholarly Misconduct

The policy defines scholarly misconduct as including: plagiarism; fabrication or falsification of research data; conflict of scholarly interest, including suppressing the publication of the work of another scholar and improper negative reviewing of a research grant application by another scholar; and other practices that deviate significantly from those which are commonly accepted as appropriate within the scholarly communities.

As well, each faculty has definitions and guidelines which are applicable to those disciplines and activities which characterize scholarly work within the faculty. In particular, the faculty guidelines deal with the retention of original data and material products relating to scholarly activity and the authorship of published or presented work.

L.3 Summary of Procedures

Possible misconduct is to be first reported to the dean of the faculty. The dean is then responsible for assessing the report and ensuring that the prescribed procedures are followed. Two formal steps are involved, an enquiry to determine if a report warrants a full investigation followed by an investigation if warranted. At the end of an investigation, the dean is required to act on the investigating committee's report including, according to the outcome, initiating disciplinary proceedings.

The detailed procedures contain provisions with respect to the time allowed for each stage, the make-up of the enquiry and investigating committees, the rules and procedures the committees are to follow and the manner of their reporting. Appeals of the outcome of the process are possible under the provisions of the University-Faculty Collective Agreement.

L.4 Confidentiality

The policy and procedures provide for a high degree of confidentiality throughout the process. Persons who report misconduct will not be named unless the case cannot be investigated otherwise and then only with those persons' consent. Persons who are reported will not be named unless and until the case against them has been substantiated by thorough investigation.

L.5 Information

Information about and copies of the policy and procedures can be obtained from deans and the office of the Vice-President (Research). Copies of the faculty guidelines and definitions are available from the office of the dean of the faculty concerned or the office of the Vice-President (Research).

M. Sexual Harassment

The University of Calgary recognizes its moral and legal responsibilities to protect its students, staff and faculty against sexual harassment and has established a Sexual Harassment Policy and related procedures to deal with this serious issue.

The simple definition of sexual harassment is "unwanted sexual attention." Any type of conduct which emphasizes the sexuality, gender or sexual orientation of an individual and creates for them an offensive, intimidating or hostile learning, working or living environment is sexual harassment. The harassment is more serious if submission to or acceptance of such conduct is made either an implicit or explicit condition of an individual's employment or academic status.

Sexual harassment may take various forms. It includes but is not limited to the following: verbal abuse or threats of a sexual nature; unwelcome remarks, jokes, innuendos or taunting about a person's sex (often linked with references to the body, attire, age or marital status of the individual); the display of pornographic, sexually offensive or derogatory pictures; unnecessary and unwelcome physical conduct such as touching, patting, pinching; unwelcome sexual invitations or requests, usually of a persistent nature; sexual assault. Gender harassment or sexism may also be one form of sexual harassment.

Sexual harassment has both males and females as its victims and perpetrators. It can occur between members of the opposite sex or of the same sex. Although sexual harassment often occurs where there is a real or perceived power imbalance, it can also occur amongst peers.

M.1 Advice and Information

Individuals with a concern regarding a possible occurrence of sexual harassment have the following mutually non-exclusive alternatives to assist them: (a) If possible, immediate personal strategies should be utilized such as informing the alleged harasser (either in person or by letter) that such behaviour is offensive and requesting an end to the perceived harassment. Frequently, this assertive stance curtails further incidents. (b) If this is not possible or productive, someone who is empowered to investigate allegations of sexual harassment should be contacted: the Sexual Harassment Advisor at 403.220.4086 or the appropriate dean or administrative equivalent who supervises the alleged harasser. In cases where physical assault has occurred, the complaint may also be lodged with Calgary Communities Against Sexual Abuse (CCASA) at 403.237.5888 or the Calgary Police at 403.266.1234. Whatever routes are taken, every effort should be made to document precisely what has transpired.

Complaints of sexual harassment do not have to enter a formal investigative and disciplinary procedure simply because an individual has chosen to speak to the Sexual Harassment Advisor. Individuals are free to simply make a report of the incident to the Advisor. These reports are useful for statistical purposes and assist in directing educational initiatives. Individuals wishing to pursue the matter can file a written complaint with the Advisor who will then attempt to effect an "informal resolution" to the problem. Informal resolutions usually involve the Advisor consulting with the two parties either individually or together. The end result must be satisfactory to all parties. If an informal resolution fails or is inappropriate, a formal hearing may be held on any written complaint of sexual harassment where there is no other negotiated or legislated procedure to pursue a complaint against the alleged offender.

Due to the nature of the issue of sexual harassment, the policy and procedures are regularly reviewed. Persons seeking information on this issue are therefore encouraged to contact the Sexual Harassment Advisor. The Advisor is presently located in the Math Sciences Building, Room 261 and may be reached by telephone at 403.220.4086.

The Advisor is also available for confidential advice and assistance in dealing with other forms of discrimination and harassment.

Additional information is available on the web (ucalgary.ca/sexualharassment and ucalgary.ca/discrimination/).

N. The Use of Banned Drugs by Student Athletes

The University of Calgary Faculty of Kinesiology is unequivocally opposed to the use by student-athletes of any banned substance in contravention of the rules of the national and/or international sport federations, the International Olympic Committee (I.O.C.) or Federation International du Sport Universities. The University of Calgary Faculty of Kinesiology is equally opposed to any encouragement of the use of such substances by individuals in positions of leadership (coaches, medical practitioners, sport scientists, therapists, administrators) or by the student-athletes themselves.

The University of Calgary adheres strictly to the Drug Education and Doping Control policies and procedures as published by the Canadian Interuniversity Sport (CIS) in accordance with the Canadian Centre for Ethics in Sport (CCES). In addition to any actions which may be taken by the CIS/CCES and/or national sport governing body and in accordance with the University's appropriate policies and procedures, the Faculty of Kinesiology, through the Dean of Kinesiology, may take action against personnel who encourage or willfully ignore the use of banned substances by student-athletes. Such action may include suspension for a stated period of time from all participation in the athletic program, indefinite suspension, or lifetime suspension.

If deemed necessary, following a substantial allegation or a positive test result with regard to a student-athlete:

I. The Athletic Director shall convene a Review Committee to deal with any matters pertaining to the use of banned drugs. This Review Committee shall consist of two representatives from the coaching and therapy staff (appointed by the Athletic Director) and the Athletic Director. The Review Committee shall meet within a period of five days after appointment and shall recommend to the Dean of the Faculty of Kinesiology:

(a) Whether or not there has been a violation of the policy related to the use of banned drugs and if so, by what athlete or staff member;

(b) The appropriate penalty or disposition, if any, to be imposed or made.

II. Penalties - Penalties that may be imposed or dispositions made for a violation may include any or more of the following:

(a) Reprimand or warning;

(b) Suspension from participation in all competition for a specified period;

(c) Ineligibility for national playoff competition;

(d) Requiring written or other undertakings;

(e) Requiring the making of procedural, structural, or other changes within the program to minimize the chance of further violations;

(f) Probation or suspension from the University.

III. The Dean of the Faculty of Kinesiology shall consider the recommendation of the Review Committee in reaching a decision.

(a) Should the penalty imposed by the Dean of Kinesiology be anything other than probation or suspension from the University (see II.(a-e)), the Dean shall advise the student-athlete in writing of the decision as expeditiously as possible. The Dean may request that the person involved appear before them to provide information. Upon being advised of the decision of the Dean, the student-athlete involved may appeal the decision to the Faculty of Kinesiology Appeals Committee. The decision of the Appeals Committee shall be final and binding.

(b) Should the penalty proposed by the Dean of Kinesiology be probation or suspension from the University (see II.(f)), the matter will proceed in accordance with the University Principles and Procedures Relating to Disciplinary Action for Non-Academic Misconduct. If the student-athlete is not registered in the Faculty of Kinesiology, the Dean of Kinesiology will recommend to the Dean of the student-athlete's Faculty that actions proceed in accordance with these principles and procedures.

IV. Education - Every effort shall be made to provide to all coaches, student- athletes, and staff members information and counselling related to the use of banned drugs and their effects. The University of Calgary Interuniversity Athletic Program policy, procedures, and penalties related to such use shall be clearly articulated to all coaches, student-athletes, and staff members.

V. The University of Calgary Interuniversity Athletic Program does not intend to usurp the role of civil and criminal authorities with respect to the non-medical use of drugs which do not appear on the banned list of the international federations or the I.O.C.

O. Statement of Support for Persons with Life Threatening Communicable Illnesses

The University recognizes that persons suffering from life threatening communicable illnesses have a right and a responsibility to continue in their regular work or academic pursuits as long as they are capable of carrying out the duties and obligations associated with those pursuits; and recognizes that individuals who contract a life-threatening communicable illness are entitled to continue in their employment or studies provided that the health, safety and well-being of others are not endangered.

The University is guided in the application of this policy by current research findings and medical advice relevant to the individual case.

All members of the University community are urged to recognize the responsibility they have for ensuring that those with such illnesses are treated in a caring and supportive manner.

Co-operative Education/ Internship

1. Summary of Programs

Contact Information by Faculty

Faculty of Arts
Location: Social Sciences 102
Telephone: 403.220.8636 or 403.210.8509
Email: artscoop@ucalgary.ca
Web page: arts.ucalgary.ca/co-op/

Haskayne School of Business
Location: Scurfield Hall 302F
Telephone: 403.220.7533
Email: hsbcoop@ucalgary.ca
Web page: haskayne.ucalgary.ca/services/career-centre/co-op

Schulich School of Engineering Internship Office
Location: Science B 149
Telephone: 403.220.2930
Email: engineer@ucalgary.ca
Web page: schulich.ucalgary.ca/internship/

Faculty of Science
Location: Undergraduate Science Centre (Specialized Programs Office) EEEL 426
Telephone: 403.220.8020
Email: usc@ucalgary.ca
Web page: ucalgary.ca/careers/studentsandalumni/coopinternship

Co-operative Education Programs

Co-operative Education programs are offered in the following areas. Please see the faculty description for further information.

Faculty of Arts
Anthropology (BSc)
Anthropology - Social and Cultural (BA)
Ancient and Medieval History
Archaeology
Canadian Studies
Communication and Culture
Communications Studies
Development Studies
Earth Sciences
East Asian Language
East Asian Studies
Economics
English
Film Studies
French
Geography
German
Greek and Roman Studies
History
International Indigenous Studies
International Relations
Italian
Latin American Studies
Law and Society
Linguistics
Linguistics and Language
Philosophy
Political Science
Religious Studies
Russian
Sociology
Spanish
Urban Studies
Visual Studies
Women's Studies

Haskayne School of Business
Accounting
Business Process Management
Business Technology Management
Energy Management
Entrepreneurship and Innovation
Finance
General
Human Resources and Organizational Dynamics
International Business
Marketing
Operations Management
Personal Finance Planning
Petroleum Land Management
Risk Management and Insurance
Risk Management: Insurance and Finance
Supply Chain Management
Tourism and Hospitality Management
Tourism Management and Marketing

Faculty of Science
Actuarial Science
Chemistry (Applied)
Ecology

Internship Programs

Internship programs are offered in the following areas. Please see faculty description for further information.

Schulich School of Engineering
Chemical
Civil
Electrical
Energy
Geomatics
Mechanical
Oil and Gas
Software

Faculty of Science
Computer Science

Introduction

Co-operative Education and Internship are optional academic programs that provide students the opportunity to enhance their education by acquiring career-related work experience before graduation. Students gain practical experience, develop a network of contacts, and obtain a better understanding of careers in their field. This program allows students the opportunity to apply knowledge and skills developed in the classroom in a practical work environment, enhancing both the academic and employment portions of their University career.

Each four month Co-operative Education/ Internship work term is registered as a Co-operative Education or Internship course. Evaluation of the Co-operative Education/ Internship course/work term is a faculty responsibility and is based on successful completion of a work term report and/or assignment(s) and satisfactory work performance. Work performance is monitored by a Career Advisor and the employer.

Pattern

Students in the Co-operative Education/ Internship program complete the normal academic curriculum while integrating a number of work terms into their program. Work terms and study sessions are full time and all students receive a salary while on a work term.

Co-operative Education students complete a minimum of twelve months and a maximum of twenty months of work experience (depending on Faculty/Department requirements), normally alternating periods of work and study starting and ending on an academic session. Internship students complete twelve to sixteen months continuous work experience between their third and fourth academic years. Co-operative Education/ Internship programs are designed to expose

Application Deadlines Chart

	May 1	September 15	October 1	October 15	December 1
Arts	-	-	-	X	-
Schulich School of Engineering*	-	-	-	X	-
Haskayne School of Business **BComm**	X** X	-	-	-	 X
Science (Ecology, Applied Chemistry and Actuarial Science)	X	-	X	-	-
Science – Computer Science* **	X	-	X	-	-

**Students may apply to Engineering Internship after October 15 but must contact the Engineering Internship Centre directly regarding admission.*

***Deadline for Transfer students*

****Students who do not meet the application deadline should contact Computer Science department regarding admission.*

students to a realistic work environment with employment occurring in all seasons of the year.

Each Co-operative Education/Internship position is evaluated as a suitable learning opportunity by the University and students continue to interact with the University for the duration of their employment. Each four-month work term is registered as a Co-operative Education/Internship course and non-refundable course fees are assessed. Courses are evaluated on a Completed Requirements/Fail (CR/F) basis. Upon successful completion of all program criteria, the Co-operative Education or Internship designation will appear on the student's academic transcript and degree parchment.

Opportunities

A variety of employment opportunities exist for Co-operative Education/Internship participants. Positions are offered in business, government, the professions and not-for-profit organizations. The number and variety of work experience positions available and advertised to Co-operative Education and Internship students varies from term to term and some positions are outside of Calgary. Students compete for job opportunities (placement is not guaranteed) and employers make the hiring decisions. Employers seek students who have relevant education, computer skills, some related work and volunteer experience, and extracurricular involvement.

Students have the option of applying to Co-operative Education/Internship positions advertised through Career Services "CareerLink", or finding their own job and having it approved as a suitable learning opportunity. Students can also apply for credit by special assessment on work experience previously completed (Engineering Internship does not offer special assessment on work experience previously completed).

2. Academic Regulations

2.1 Admissions

Information pages describing each Co-operative Education/Internship program and application forms are available on the Career Services Co-op/Internship page(ucalgary.ca/careers/co-op-internships). Information is also available at the Engineering Internship Centre (SB 149), the Haskayne School of Business Co-op Office (SH 349), and the Arts Co-op Office (SS 102). Students in Bachelor of Arts and Bachelor of Science Co-operative Education programs normally apply to Co-operative Education in the second year of their program. Applications to the Haskayne Co-op Program are accepted twice a year - on May 1st and December 1st. Direct entry students normally apply during their second year of the BComm Program; change of program and transfer students apply by May 1st of the year that they apply to the business school, normally the end of their second year. Students in Schulich School of Engineering (applications accepted by October 15th) and Computer Science (applications accepted by May 1st and October 1st) Internship programs apply in third year. All students in the Faculty of Science (Ecology, Applied Chemistry and Actuarial Science) can apply during their second year by May 1st and December 1st. Students in the Faculty of Arts apply during their second year on October 15st directly through CareerLink (careerlink.ucalgary.ca/home.htm).

Students should be aware that the Career Development Workshop or equivalent is a requirement for admission. For the Faculty of Arts the pre-employment workshops are held after admission to the program.

Application Deadlines

Please see the Application Deadlines Chart.

2.2 Requirements

Students must:

- Be registered as full-time students,
- Be registered in a faculty/department offering Co-operative Education/Internship programs,
- Meet faculty/department GPA and course entrance requirements (Consult the appropriate faculty sections of this Calendar),
- Complete the Career Development Workshop or equivalent.

Note: Students entering the Haskayne School of Business are required to complete a Co-op Orientation and workshops in lieu of the Career Development Workshop.

Students applying to Co-operative Education/Internship should also be aware of the following:

1. Students must be legally permitted to work in Canada. International students must obtain a Co-op Work Permit to be eligible for work placements.

2. Students who are registered in combined degree programs can be eligible for Co-operative Education/Internship programs if one of the majors is in a faculty or department in which a Co-operative Education/Internship program is offered.

3. Students may be required to attend a personal interview with Co-operative Education/Internship and/or the faculty to decide admissibility.

4. The University reserves the right to refuse admission to a Co-operative Education/Internship program on academic or other grounds.

5. Transfer students from other universities will be considered for admission to the Co-operative Education/Internship program. Please refer to the application deadlines for the Co-operative Education/Internship program. Transfer students applying to the Haskayne School of Business apply to the Co-operative Education/Internship program by May 1st of the year they are applying to the Haskayne School of Business. All transfer students should complete one academic session at the University of Calgary prior to a work term.

Application Process

Students must submit a completed Co-operative Education/Internship Student Application form by the appropriate deadline date. For more information on the application process, students should contact Career Services (MSC 188), the Engineering Internship Centre (SB 149), the Haskayne School of Business Co-op Office (SH 302F), the Arts Co-op Office (SS 102), or the Science Co-op/Internship Office. Incomplete applications will not be accepted.

Applications for admission are reviewed by the faculty/department/internship office/Engineering Student Centre.

Admitted students pay an admission fee of $50.00 to the Fees Office and are given access to the Co-op/Internship job postings.

Admission Appeal Procedure

Students who believe there has been an error in the assessment regarding the suitability of their admission to the program should contact the Faculty office.

No student whose application is in the appeal process will be allowed to apply for Co-operative Education/Internship positions until a formal decision on the appeal has been made.

2.3 Registration

Course Registration

Registration in Co-operative Education/Internship course(s) occurs when the student

accepts a position with an organization and completes the Co-operative/Internship Work Term Record document on Career-Link. Students who have accepted a placement obtained through the Co-operative Education/Internship placement process are required to complete a work term record immediately according to their Faculty Co-operative Education/Internship processes. The completed work term record is used by Career Services or the relevant Internship Office to ensure the student is registered in the appropriate co-op/internship courses. The appropriate tuition fees will be payable to the Fees Office.

Students registered in a Co-operative Education or Internship course are considered full-time students by the University for the purpose of student loans, Students' Union fees and Student Health and Dental Insurance coverage. Because of Revenue Canada's policy regarding the Education Tax Amount, Co-operative Education and Internship students are not classified as full or part time on the T2202A form issued by the University and do not qualify for the Education Tax Amount.

2.4 Course Work

Planning Work Terms and Academic Sessions

Please refer to the appropriate Faculty section in this Calendar for information on the number and scheduling of work terms.

It is the student's responsibility to plan work terms and academic sessions in relation to course availability. The University cannot guarantee all courses will be available in all sessions.

Both Co-operative Education and Internship programs should start and end with an academic session. Students in Co-operative Education programs normally alternate between periods of work and study. Work periods can be four months or eight months (two consecutive work terms) starting in January, May and September. Students in some programs may do three consecutive work terms with permission from their department of study. Co-operative Education programs with three or four work terms have a maximum of two spring/summer work terms. Co-operative Education programs with five work terms have a maximum of two consecutive, spring/summer work terms and three summer work terms in total.

Internship programs are a minimum of twelve and a maximum of sixteen consecutive months.

Co-operative Education and Internship Courses

Each four-month Co-operative Education/Internship work term is registered as a Co-operative Education/Internship course. Co-operative Education/Internship courses are in addition to the normal requirements for a degree program.

Each work term (Co-operative Education/Internship course) is approximately four months in duration beginning either in January, May or September. Courses are graded on a Completed Requirements/Fail (CR/F) basis. This grade is not included in the calculation of the grade point average.

Once students are registered in a Co-operative Education/Internship course (i.e., have accepted a placement), they are committed and expected to fulfill their commitment. If the placement accepted is for more than one four-month work term, students are registered in the appropriate number of Co-operative Education/Internship courses and are committed to complete all of them.

Students cannot withdraw from a Co-operative Education/Internship course (or leave a work term/placement) without permission from both Co-operative Education/Internship Program Office and the Faculty. (See 2.8 Withdrawal Policies.)

Transfer Credit for Co-operative Education/Internship Courses

Students transferring to the University of Calgary from another university, or transferring from one program to another, should consult with the faculty regarding possible transfer credits. To receive a degree with "Co-operative Education" students must complete a minimum of one four month work term under the University of Calgary. Some faculties may require more than the minimum of one work term and each faculty determines the maximum number of transfer credits allowed.

To receive a degree with "Internship" designation students must complete a minimum of twelve consecutive months of work while enrolled in the University of Calgary Engineering Internship Program.

Credit by Special Assessment

Students who feel that they have previous relevant work experience and who wish to receive formal university credit may apply for credit "by special assessment". Students should consult THEIR FACULTY CO-OPERATIVE EDUCATION/INTERNSHIP OFFICE for instructions regarding the application and review process. Prior work experience will be evaluated by the faculty in which the student is registered. Students granted credit "by special assessment" will be assessed the course fees for Co-operative Education/Internship courses. **Note:** special assessment is not available for the Engineering Internship Program.

2.5 Student Standing

Co-operative Education/Internship Course Evaluation

Successful completion (Completed Requirements) of a co-operative education course/work term requires submission of work term reports and/or assignments and satisfactory job performance.

Work Term Report: The work term report is evaluated by a faculty member. Provided that it meets established criteria, the report is marked a Pass. If it is sub-standard, a Resubmit is required.

Failure to meet the work term report requirements results in a grade of "F" for the course. The student will be required to withdraw from the program and will not receive Co-operative Education/Internship designation.

Work Term Assignments: Students in the Schulich School of Engineering will be expected to complete assignments as part of their internship courses. Work term assignments must be submitted by specified dates, and will be evaluated by staff in the Schulich School of Engineering. Provided an assignment meets established criteria, the assignment will be deemed to be a Pass. If an assignment is sub-standard, a resubmit is required. Students should attempt to submit all course components by their respective specified deadlines. All required coursework must be submitted no later than the date on which classes end in the term as specified in the Academic Schedule. All coursework submitted within a 5 day period following the date when classes end will only be accepted if an extension was previously approved by the course instructor. A Deferral of Term Work form must be completed, should an extension of time be sought for completion of any term work beyond the 5 day period. Deferrals may only be granted at the discretion of the Dean of the Schulich School of Engineering, and will normally not exceed thirty days. In the event a student receives permission from the Dean to defer their coursework, they will receive a final grade of incomplete (I) during the deferral period. If all course components are not satisfactorily completed and submitted prior to the end of the deferral period, the final course grade will be changed to a fail (F). A final grade of "F" in an internship course will prevent students from registering in subsequent internship courses. If eligible, the student may choose to repeat the course in the subsequent term. Not clearing a final grade of "F" from an Internship (INTE) course will result in the student being removed from the internship program, and may result in the student being withdrawn from the Engineering program. Note that a student may only receive a final grade of "F" once during the internship period and still remain in the internship program.

Job Performance: The student's job performance is assessed by the employer. Performance evaluations are conducted periodically during the internship and submitted to the Internship Office. An Advisor monitors performance feedback to determine whether any follow-up action is required.

If a student receives unsatisfactory performance or is asked to leave employment by an employer, the University will investigate the situation and determine the appropriate grade. If a student is asked to leave employment for "just cause" a grade of "F" will be given and the student will be required to withdraw from the Co-operative Education/Internship program. The student will not receive Co-operative Education/Internship designation and a permanent notation will be placed on the transcript of record that the student was required to withdraw from the Co-operative Education/Internship program.

Maintenance Requirements

Students must meet minimum GPA and course requirements established by faculty and maintain full-time status on academic sessions. Students who do not meet these requirements will be required to withdraw from the Co-operative Education/Internship program.

2.6 Graduation

Students who successfully complete the Co-operative Education/Internship program as required by the faculty in which they are registered will receive Co-operative Education or Internship designation on their transcripts and degree parchment.

2.7 Fees and Expenses

Admission fee: $50.00

Course fees are assessed for each Co-operative Education/Internship course at the time that the course is registered. Fees are payable on the normal fee deadlines. For more information please refer to the Tuition and General Fees section of the Calendar.

Co-operative Education/Internship course fees are non-refundable and are due and payable, even if the student subsequently withdraws from the course(s) or is required to withdraw from the Co-operative Education/Internship program. (See 2.8 Withdrawal Policies).

In addition to the Co-operative Education/Internship course fees, other fees including full-time Students' Union fees will be assessed. Campus Recreation and Athletic fees are optional. Students may opt out of Health and Dental Insurance in the Fall and Winter Terms with proof of alternate coverage. Students who register for other University courses while on a work term, will be assessed other course fees on a fee per course basis. Students should refer to the Tuition and General Fees section of this Calendar for more information.

2.8 Withdrawal Policies

The Co-operative Education/Internship program strongly values the commitment that is made between students and Co-op/Internship Employers. Our withdrawal policies have been set to encourage students to be accountable for their commitments.

Students cannot withdraw from a Co-operative Education/Internship course (or leave a work term/placement) without permission from both their Co-operative Education/Internship Program Office and the faculty.

Permission is only granted in cases of serious illness, domestic affliction or for academic issues. Students who receive permission to withdraw will receive credit for completed course/work terms. They will be withdrawn from the current registered course/work term. They will also be dropped from registered course/work terms not yet started and no fees will be charged for these course/work terms.

Withdrawal with Permission

(a) Student contacts their appropriate co-operative or internship office;

(b) A University representative meets with the student and employer to investigate and try to resolve issues when feasible or appropriate and seek a resolution;

(c) When the issue meets the criteria above and cannot be resolved, faculty approval can be given for the student to withdraw without penalty.

Withdrawal without Permission

Students who leave a work term (withdraw from a Co-operative Education or Internship course) without permission will be assigned a grade of "F" on the course and will be dropped from subsequent courses. No fees will be charged for the subsequent courses.

In addition students will be required to withdraw from the Co-operative Education/Internship program and will not receive Co-operative Education/Internship designation, notwithstanding the fact that they had completed the minimum work term requirements for the program. A permanent notation will be placed on the transcript of record that the student was required to withdraw from the Co-operative Education/Internship program.

Tuition and General Fees

The year at the University of Calgary has been organized into the following three terms:

Fall Term: September - December

Winter Term: January - April

Summer Term (Spring/Summer Intersession): May - August

THE UNIVERSITY RESERVES THE RIGHT TO CHANGE THE FEE STRUCTURE WITHOUT NOTICE.

P.1 Undergraduate and Graduate Fees

For more information, please refer to the "Undergraduate and Graduate Tuition and General Fees Chart (2016–2017)" on page 51.

P.1.1 Undergraduate Fees

Undergraduate students are assessed tuition and general fees as listed in the Tuition and General Fees chart. Each academic term has its own deadline dates. Please refer to the Academic Schedule for this year's deadline dates.

Undergraduate students taking a graduate-level course (600 or above) will pay the Graduate Studies course fee. Graduate students taking an undergraduate-level course will pay the undergraduate course fee.

Interest will be charged on outstanding balances at an annual rate as determined by the University (12 per cent at the time of the printing of this Calendar). Fee and interest rates may be subject to change without prior notice.

P.1.2 Audit Fees

Audit fee rates per 3 units (0.5 full-course equivalent). Please see the Audit Fee Rates Chart below.

In addition to the tuition fees, students auditing courses must pay appropriate general fees as indicated in the fee chart. Where applicable, the international student fee differential will be assessed.

P.1.3 Co-operative Education/Internship Course Fees

A non-refundable fee of $50.00 is payable upon admission to the Co-operative Education or Internship program. Students in the Schulich School of Engineering must pay this admission fee at Enrolment Services (MacKimmie Block 117). All other students will see this charge in their online Student Service Centre and can pay via standard payment options.

Full-time Co-operative Education/Internship students are required to pay Students' Union fees and Student Health and Dental Plan fees. Campus Recreation, Athletic and Student Services fees are not charged; however, if the student concurrently registers in other University of Calgary courses, compulsory general fees in total will be charged.

Where applicable, the international student fee differential will be assessed.

Co-operative Education/Internship fees are non-refundable once the student has registered in the course.

P.1.4 Distance Education Off-Campus

Fees for off-campus credit courses will be assessed at the time of registration in the course(s) and are due and payable by the prescribed deadlines.

P.1.5 Exchange Students

The amount of tuition fees assessed and the institution to which fees are to be paid are determined by the Exchange agreement that is in effect at the time of the commencement of the program.

University of Calgary OUTGOING Exchange students will automatically be opted out of the Student Health and Dental Plan. To opt into the plan, students must complete the appropriate opt-in form available from the Student Health and Dental Plans Office or from their exchange co-ordinator. Students will automatically be assessed the Bursary Fund donation and if they wish to opt out, must complete the opt-out form available in the Schedule of Classes.

INCOMING Exchange students will not be automatically assessed for either the Student Health and Dental Plan fee or the fund raising fee. These students should contact the Student Health and Dental Plans Office if they wish to obtain insurance. Completion of the Change of Donation form is required if the student chooses to opt into the fund raising campaign.

Inquiries regarding assessments should be directed to the Exchange student advisors in Enrolment Services.

P.1.6 Fees - International Students

Students who are not Canadian citizens or permanent residents of Canada are required to pay a differential fee. The required additional fees must be paid at the same time as the regular tuition and general fees.

Canadian Student status includes: a) Canadian Citizens; b) Landed Immigrants and Permanent Residents; c) the dependents of foreign Consular officials.

International students whose immigration status changes will be required to provide proof of the new status before a change in fee assessment will be made. A change in a student's immigration status will not alter the student's fee assessment unless appropriate notification is submitted to Enrolment Services on or before the deadline date for payment of fees for the current term.

International undergraduate students pay a visa differential that is two times the international student base tuition for both undergraduate- and graduate-level courses, in addition to the international base tuition.

For 2016/17 the base tuition for a 3 unit course (0.5 full-course equivalent) at the undergraduate level for international students is $611.28; the base tuition for a 3 unit course (0.5 full-course equivalent) at the graduate level for international students is $811.32.

Audit Fee Rates Chart (Per 3 Unit Course)

Undergraduate-level (except MD and JD) Canadian Students	Undergraduate-level (except MD and JD) International Students	Graduate-level Canadian Students	Graduate-level International Students
$269.31	$916.92	$357.39	$811.32

Note: Applicants who are in Canada on a Work Permit or dependents of persons on a Work Permit are required to pay these additional fees (unless the dependents are Canadians or Landed Immigrants).

P.1.7 Fees - Senior Citizens

The University of Calgary waives tuition fees related only to undergraduate, bachelor's level courses for senior citizens. The senior citizen must be a resident of Alberta and is defined as an individual who is 65 years of age or older by the deadline to pay the balance of fees for any particular academic term. Students must pay the appropriate application fee and, where designated, mandatory supplementary fees for courses. If the student registers for a locker, this fee will also be assessed.

Students' Union, Campus Recreation, Athletic and Student Services fees are waived; however, if senior citizens wish to use any of these services, they must pay the required fees by the deadline date. Any senior citizens who register as full-time students will be assessed the Students' Union Bursary, as well as the Health and Dental Plan fees and must opt out using forms available at Enrolment Services (ucalgary.ca/registrar).

After admission and upon registration in courses as a senior citizen, appropriate fees will automatically be waived.

P.1.8 Mandatory Supplementary Fees for Courses

Course supplementary fees may be charged to students for materials or services associated with particular courses or sections of courses. Students will be notified of the additional fees in one of three ways: (1) mandatory supplementary fees will be described and listed in course outlines; (2) such fees are viewable under Class Notes through the online Class Search; (3) upon registration in a class with Supplementary fees, such fees are indicated in the Finances section under Account Inquiry of the online Student Service Centre via MyUofC. Departments/instructors are not permitted to charge mandatory supplementary fees which are not assessed by Enrolment Services. Students may be charged a laboratory breakage fee by departments.

Mandatory supplementary fees for courses will be payable to Enrolment Services at the University of Calgary by the same deadline dates for all fee assessments and are non-refundable after the last day to drop courses for the term(s) in which the course is being offered.

The following general principles are applicable to course supplementary fees:

1. Operating revenues (including tuition fees) should provide for credit instruction, which includes the following:

   a. Evaluation of work/performance which includes practicums, marking of papers, examinations and other assignments.
   b. Laboratory use (including computer laboratories), laboratory assistance and/or supervision, laboratory materials or supplies, if required for credit instruction, not including laboratory coats and other equipment which becomes the property of the student.
   c. Resources to support instruction; that is, materials or services required as a result of the method of teaching used by the instructor, including but not limited to the following: classroom audio visual equipment, models for art classes, practice rooms, films and videotapes used for instructional purposes, course outlines, etc.
   d. Library facilities and related basic services.

2. Mandatory supplementary fees for courses are those which may be considered for special materials or services not included under general principle #1, if deemed necessary for the successful completion of the course as approved by the Vice-President (Finance & Services).

3. Optional supplementary costs are those which may be incurred for materials which become the property of the student and for which the student has the option of obtaining from a variety of sources. Examples include but are not limited to the following: art supplies, equipment which would become the property of the student, laboratory coats, laboratory manuals, and materials which are reproduced (all of which could, and probably should, be purchased through a University retail outlet).

These principles do not apply to courses offered off-campus. Questions regarding mandatory supplementary fees can be directed to Enrolment Services or the department initiating the fee.

P.1.9 Haskayne School of Business Fee

Effective Fall 2011, the Government of Alberta approved a tuition differential for courses in the Haskayne School of Business. These differential fees are being phased in by course level. For the 2016-2017 year, 200-, 300-, 400- and 500-level Commerce courses (excluding Tourism Management) will be assessed an additional $238.83 per 3 units. Students admitted to the Haskayne School of Business prior to Fall 2011 are exempt.

P.1.10 Faculty of Law

Tuition fees in the Faculty of Law are assessed on a per course basis. The tuition fee for one course is $1,026.24.

There is a mandatory $75.00 per term Law Career Services Fee for all Law students.

P.1.11 Faculty of Nursing

Fees are assessed by and are payable to the University of Calgary whether the student is attending the University of Calgary or Medicine Hat College campus when admitted to the University of Calgary Nursing program.

P.1.12 Postgraduate Medical Education

A tuition fee of $485.23 per term, to a maximum of $979.46 over three four-month terms, will be charged to all residents/fellows enrolled in postgraduate medical education.

The above fees will be assessed at the time of registration with the Cumming School of Medicine Office. All fees will be waived on a reciprocal basis for Canadian medical school residents taking electives at the University.

Residents/fellows will be sent a confirmation of their fee assessment with the fees due and payable by the date noted on the assessment. All fees are payable to Enrolment Services at the University of Calgary.

P.1.13 Schulich School of Engineering

Engineering Student Society (ESS) Fee

Full-time Engineering Students pay a mandatory $10.00 fee per term for the Engineering Students' Society.

The Engineering Students' Society (ESS) is an organization affiliated with the Association of Professional Engineers and Geoscientists of Alberta. The ESS provides a social atmosphere for engineering students and, in addition, acquaints them with the professional and technical responsibilities of the profession. It is expected that all Engineering students will join the Society, participate in its activities and promote its interests.

P.1.14 Faculty of Social Work (Edmonton and Lethbridge Divisions)

Students who are admitted to the University of Calgary's Faculty of Social Work program but are attending the University of Lethbridge or the University of Alberta campus will be assessed University of Calgary tuition fee rates. Students will also be assessed for the fund raising campaign, but can opt out of this fee by completing the Change of Donation form. University of Calgary general fees will not be assessed; however, students will be responsible for paying the required general fees of the institution that they are attending. These fees will be visible in the online Student Service Centre and can be paid via standard University of Calgary payment options.

Inquiries regarding fees may be directed to the program co-ordinator at the institution which the student is attending or to Enrolment Services.

P.1.15 General Fees

P.1.15.1 Students' Union Fees

Full-time undergraduate students (excluding Medicine - MD) are required to pay $32.50 in Students' Union general fees per term. This is assessed to maintain the operations of the Students' Union. In addition students are required to pay $23.00 per term in Students' Union Ancillary Fees. This consists of eight separate fees previously approved by student referendum to support external third parties or specific SU programs. Fee amounts are directly transferred by the Stu-

dents' Union to appropriate committees or third parties to administer as follows:

Radio Station (CJSW) $5.00

Library Assistance Fee $3.75

Campus Television (NUTV) $4.50

Student Newspaper (Gauntlet) $4.50

Student Legal Assistance $1.75

Refugee Student Program $2.25

Volunteer Services $0.75

Committee of 10,000 $0.50

Total $23.00

More information is available on the Students' Union's website at su.ucalgary.ca.

P.1.15.2 Student Health and Dental Plan Fees

By referendum, all full-time undergraduate students in Fall and Winter (term course load of 9 units or more) at the University of Calgary are automatically enrolled in the Student Health and Dental Plan when they register for classes. For the convenience of students, payments are made in two installments, September and January. The premium for each plan is an annual one, therefore the process for waiving fees for the year must be done prior to the deadline noted below.

The Health Plan provides students with a comprehensive set of health insurance benefits (prescription drugs, paramedical services, such as physiotherapy, chiropractic treatment, ambulance services, and many other benefits). This plan is supplementary to any provincial health care plan. The Managed Dental Plan provides students with dental coverage through a specific network of dental clinics throughout Calgary. It is mandatory for students to visit a Network Dental Clinic in order to be eligible for coverage. Please contact the Undergraduate Health and Dental Plan Office or visit mystudentplan.ca/uofcalgary for a list of clinics. For eligible students starting in the Fall Term, coverage begins September 1 and ends August 31 provided there has been no change in their eligibility status from the Fall Term to the Winter Term. In cases where there has been a status change, coverage may end December 31. For eligible students starting in the Winter Term, coverage begins January 1 and ends August 31.

Optional family coverage (for one or both plans) is also available for an additional fee. This procedure must be completed by September 30th for new Fall Term undergraduate students and by January 27th for new Winter Term undergraduate students.

If proof of comparable coverage is presented, prior to the opt out deadline, to the Undergraduate Health and Dental Plan Office, students can opt out of the Health and/or Dental Plan. The opt out deadline is September 30, 2016 (Fall Term fee payment deadline). Continuing full-time students need only opt out of the plans once. An eligible student can opt back into the plan unconditionally prior to the fee deadline every Fall Term or within 30 days of loss of comparable coverage during the year. The health and dental insurance fees are non-refundable if a student withdraws from a term.

For further details, please contact:

Undergraduate Health and Dental Plan Office (352 MacEwan Student Centre)

Telephone: 403.220.3906

Fax: 403.282.2729

Email: uofcalgaryplan@mystudentplan.ca

P.1.15.3 Student Services Fee

Students are required to pay a Student Services Fee.

Undergraduates Per Term

Fall or Winter Full-Time $225.00

Fall or Winter Part-Time $75.00

Spring or Summer Full-Time $75.00

Spring or Summer Part-Time $37.50

Graduates Per Year

Full-Time $450.00

Part-Time $150.00

A Student Services Fee of $225.00 per term for full-time students and $75.00 per term for part-time students (pro-rated for Spring and Summer Intersession) has been approved.

By implementing the Student Services Fee, the University is eliminating the fees it charges students and graduates for a student transcript, the individual counselling fees levied through University Health Services, and the small levies it assesses through the Students' Union fee. The registration and thesis fees paid by graduate students are also eliminated.

P.1.15.4 Campus Recreation and Athletic Fees

Descriptions of the Campus Recreation and Athletic programs are to be found in the Student Services section of this Calendar.

There is no summer athletic program. Please note that part-time students are not eligible to participate on interuniversity teams. Payment of the athletic fee entitles part-time students to free admission to interuniversity athletic games.

Students completing all University of Calgary courses off-campus are not required to pay campus recreation or athletic fees.

Campus recreation and athletic fees are non-refundable if a student withdraws from a term.

P.1.15.5 Summer Term Fees

For the Summer Term (including Spring/Summer Intersession), a student is considered to be full-time with 6 units (1.0 full-course equivalent) and part-time with 3 units (0.5 full-course equivalent).

P.1.15.6 UPass (Universal Bus Pass)

As part of their annual election process in 2002, the Students' Union and Graduate Students' Association held referenda asking whether their members supported the introduction of the compulsory UPass program for all full-time students. The UPass proposal would require that each full-time student (undergraduate and graduate) attending the University of Calgary be assessed a compulsory fee for each term (Fall, Winter, and Summer). In return, each assessed student would be entitled to a special transit pass that allowed them full access to available transit services during that period of time. The program began September 1, 2002. The Spring/Summer UPass was introduced for full-time students in 2012.

More information can be found at: ucalgary.ca/unicard/upass.

The 2016/17 rate is $130.00 per term.

Eligibility for the UPass

Full-time Students

To be eligible you must be a full-time undergraduate or graduate student and be registered in three courses for the Fall or Winter Terms or two courses for the Summer Term (including Spring Intersession).

Students who are issued the UPass when their status is full-time and subsequently reduce their class load to part-time are no longer considered eligible to have the sticker or use the UPass program. You are required to return this sticker to the Campus Ticket Centre within 7 days of the status change. Students that change their status from part-time to full-time must wait 48 hours for the change to appear in the system before they can get a UPass.

Co-operative Education and Internship Students

Co-operative education and internship students who are on work terms are not automatically assessed the UPass fee, but are eligible to have the fee added for the session(s) as an active co-operative education student (Fall, Winter or Summer). To do so, make sure you are registered as a Co-operative Education/Internship student; contact Enrolment Services to have the UPass fee added to your student account and after the system is updated (1-2 days), the UPass sticker may be picked up at the Campus Ticket Centre. If you are registered in a course at the University of Calgary while you are on a work term, you will automatically be assessed the compulsory UPass fee and can pick up a UPass.

P.2 Donations

P.2.1 Bursary Funds

All students (including Open Studies and Visiting students) are being asked to make a tax deductible donation to the Student Peer Assistance Bursaries (undergraduate students) and the Graduate Students' Association Bursary Fund (graduate students). Full-time undergraduate students are automatically levied $10.00 per Fall and Winter Term; part-time undergraduate students and Summer Term (including Spring Intersession) students are levied $7.00 per term. Full- and part-time graduate students are levied $10.00 per year. The monies raised will be used to provide bursaries for undergraduate and graduate students in financial need. Change or cancellation of donation forms are available at Enrolment Services (ucalgary.ca/registrar/forms_students/) and must be submitted on or before the term fee

deadline to opt out of the fee. The donation is not refundable after the deadline for payment of fees.

P.2.2 Calgary Engineering Endowment Fund

All Engineering students are being asked to make a tax deductible donation to the Calgary Engineering Endowment Fund. Full- and part-time undergraduate students (excluding Open Studies and Diploma students) are automatically levied $25.00 per Fall and Winter Terms. The monies which are raised will be put into an endowment fund with the interest being used towards improving the Engineering undergraduate program. The donation is not refundable after the deadline for payment of fees. Change or cancellation of donation forms are available at the Schulich School of Engineering Office and Enrolment Services or online at ucalgary.ca/registrar/forms_students/ and must be submitted on or before the term fee deadline to opt out of the fee.

P.3 Fee Policies

P.3.1 Full Payment of Fees

Balance of fees must be paid or notice of financial assistance provided, before the deadlines for any term. Consult the Academic Schedule for fee payment deadline information.

Fees for consecutive terms may be paid before the May or September deadlines.

P.3.2 Method of Payment

Please note: The University of Calgary does not accept Credit Card payments for tuition and general fees, and effective September 2016, does not accept cash payment.

Students may pay their fees by online banking, cheque, money order and bank draft. International students without a Canadian bank account can use Western Union or other wire transfer services.

To pay online, add the University of Calgary - Tuition Fees (title may vary from bank to bank) as a payee on your bill payment profile, and use your UCalgary account number to complete the payment.

For more information, please see: ucalgary.ca/registrar/fees.

If fees are to be paid from government student loans, proof of government funding must be presented and certified by the University of Calgary prior to the fee deadline. Student loans may be signed electronically with a pre-approved remittance amount or in person at Enrolment Services. A remittance amount is typically sent directly to the University to pay a student's outstanding balance. No interest accrues if payment is received within 30 days of the term fee deadline. Payments received after the 30 day deferral has expired are subject to late interest. Any amount owed in excess of the remittance amount must be paid by the fee deadline.

Students receiving disbursement of their student loan in one installment may have both Fall and Winter Term tuition and general fees deducted from the single installment. Students receiving disbursement of their loan in two installments will automatically have Fall Term fees deducted from the first installment and Winter fees deducted from the second installment. The student is responsible to pay any fees not covered by the incumbent Winter disbursement. Other amounts owing to the University may be deducted from either or both installments at the determination of the University of Calgary.

If financial assistance is refused by the loan provider, students are responsible to pay outstanding fees by the term fee deadline, including any late interest if the decision has occurred after the fee deadline. The letter of refusal must be presented to the Student Receivables office in order to appeal the late penalty. Note that students will not have their registration cancelled if financial assistance is refused and remain fully liable for all tuition and general fees owed to the University of Calgary and affiliates.

For more information about financial assistance, please see: ucalgary.ca/studentfinance.

P.3.3 Late Payment of Fees

Students whose fees are not paid by the prescribed deadlines and who have not applied for financial assistance will not have their course registrations cancelled, and will be indebted to the University for their full tuition and general fees. Interest will be charged on outstanding balances at an annual rate as determined by the University (12 per cent at the time of the printing of this Calendar). Fee and interest rates may be subject to change without prior notice.

P.3.4 Delinquent Student Accounts

Any current or former student with an overdue debt to the University of Calgary, including any administrative department and the Students' Union or Graduate Students' Association, will not be allowed to register, will not receive transcripts of grades and may also be denied access to other University services until the outstanding account is settled in full, or in exceptional circumstances an acceptable arrangement is made. Delinquent student accounts will be referred to a collection agency.

Students are encouraged to consult with Enrolment Services or the Counselling Centre if they are having difficulty meeting their financial obligations.

Note: This policy pertains to students enrolled in all courses offered by the University of Calgary.

P.3.5 Fee Refunds

No tuition or general fee refunds will be made where the official date of withdrawal is subsequent to the drop deadline for the corresponding term. Where fees have been paid from a government student loan, and after withdrawal the student still qualifies for full-time status, the refund will be paid to the student. If the withdrawal results in a reduction of the student's status to part-time, the refund will be forwarded to the agency that negotiated the loan to be applied towards the student's outstanding loan(s).

Undergraduate Tuition and General Fees Chart (2016–2017)

	Per 3 Units	Co-op/Intern (4 Month)	Law (18 units)	Vet Medicine	IFP 3 units
Canadian Student Tuition	$538.59	$423.00	$6,157.44	$5,432.10	$538.59
International Student Tuition	$611.28	$479.10	$6,821.64	*	$1,224.00
Visa Differential	$1,222.56	$958.20	$13,643.28	N/A	N/A

* International students are not eligible for Veterinary Medicine at this time.

Canadian Student Tuition	**Medicine**					
	Year 1	Fall	$7,506.09	*Year 2, 3*	Spring	$5,004.06
		Winter	$7,506.09		Fall	$5,004.06
					Winter	$5,004.06
		Total	$15,012.18		Total	$15,012.18

General Fees	Full-Time (9+ units)	Part-Time (3-6 units)	Co-op/Intern 4 Month	Law (18 units)	Medicine	Vet Medicine
Students' Union General	$32.50	$14.50	$4.00	$32.50	$5.50	$32.50
Students' Union Ancillary	$23.00	$17.25	$23.00	$23.00	$22.50	$23.00
U-Pass	$130.00	-	-	$130.00	$130.00	$130.00
Student Health Plan	$51.50	-	$51.50	$51.50	$51.50	$51.50
Student Dental Plan	$45.00	-	$45.00	$45.00	$45.00	$45.00
Campus Recreation	$35.90	$35.90	-	$35.90	$35.90	$35.90
Athletics	$49.29	$49.29	-	$49.29	$49.29	$49.29
Donation	$10.00	$7.00	$10.00	$10.00	$10.00	$10.00
Student Services Fee	$225.00	$75.00	-	$225.00	$225.00	$225.00
	$602.19	$198.94	$133.50	$602.19	$574.69	$602.19

Spring / Summer General Fees	Full-Time (6+ units)	Part-Time (3 units)	Co-op/Intern (2 Months)
Students' Union General	$7.50	$7.00	$4.00
Students' Union Ancillary	$15.25	$15.25	$15.25
U-Pass	$130.00	-	-
Campus Recreation	$17.95	$17.95	-
Donation	$7.00	$7.00	$7.00
Student Services Fee	$75.00	$37.50	-
	$252.70	$84.70	$26.25

Undergraduate Market Modifier

	Per 3 units
Haskayne School of Business	$238.83

Graduate Tuition and General Fees Chart (2016–2017)

For more details refer to the Faculty of Graduate Studies Calendar (ucalgary.ca/pubs/calendar/grad/current/).

	PhD Degree (except MBA)	Master's with Thesis (except MBA)	Course-based & Part-Time Programs (except MBA)	Continuing	Per 3 Units (except MBA)	MBA Thesis	MBA Course	MBA Course (with Tuition Differential)
Canadian Student Tuition	$5,593.50	$5,593.50	$5,593.50	$1,627.38	$714.78	$11,463.12	$1,302.33	$1,623.12
International Student Tuition	$12,695.88	$12,695.88	$12,981.12	$3,693.48	$1,622.64	$25,293.24	$2,880.78	-

General Fees	Full-Time	Part-Time
Grad Students Association (GSA)	$160.07	$132.57
Group Insurance	$11.00	-
U-Pass	$390.00	-
Health Insurance	$283.52	-
Dental Insurance	$231.64	-
Campus Recreation	$107.71	$107.71
Athletics	$49.29	$49.29
Donation	$10.00	$10.00
Student Services Fee	$450.00	$150.00
	$1,693.23	$449.57

Awards and Financial Assistance

Undergraduate Student Awards Office
Location: MacKimmie Block 117
Telephone: 403.210.7625
Email: ucawards@ucalgary.ca
Website: ucalgary.ca/awards

Financial Assistance and Loans Office
Location: MacKimmie Block 117
Telephone: 403.210.7625
Email: financialaid@ucalgary.ca
Website: ucalgary.ca/studentfinance

Graduate Student Awards Office
Location: MacKimmie Tower 213
Website: grad.ucalgary.ca/awards

The University of Calgary supports students through scholarships, bursaries and awards and participates in various government student assistance programs. Programs are available to recognize outstanding achievement, community service and leadership and provide financial support to students in need.

Students are encouraged to develop a plan for financing the costs of university from their first term through to the completion of their program. To access financial assistance, apply for awards and government student loans well before the start of the academic year and be aware of the application deadlines for awards and government student loans. Although each student's needs and resources differ, the University provides a list of general fees and expenses. Refer to the "Tuition and General Fees" section in this Calendar for details.

Q.1 Awards for Undergraduate Students

Q.1.1 Types of Awards and Requirements

Scholarship: Offered in recognition of academic standing. To be considered for a scholarship, a student must normally present a minimum GPA of 3.20.

Bursary: Offered on the basis of clearly demonstrated financial need and satisfactory academic achievement. To be considered for a bursary, a student must present a minimum GPA of 2.60 and complete the financial information section of the awards application.

Competitive Award: Requires the submission of an online awards application. Academic standing and other criteria such as financial need, field of study, extra-curricular activities and contribution to community and/or campus life may be considered. Competitive awards require applicants to have completed a minimum of 24 units (4.0 full-course equivalents) over the previous Fall and Winter Terms at the University of Calgary.

Nominated Award: No awards application is required. The faculty or department recommends recipients to the Student Awards Office. Nominated awards require students to have completed a minimum of 24 units (4.0 full-course equivalents) over the previous Fall and Winter Terms at the University of Calgary.

Q.1.2 Awards Application Deadline

High School Awards Early Deadline: December 15 of year prior to entering the University of Calgary. Applicants will be considered for Chancellor's Club Scholarships, Leader in Health Sciences Scholarships, Seymour Schulich Academic Excellence Scholarships and Seymour Schulich Community Service/ Entrepreneurial Awards.

High School Awards Final Deadline	March 1
Medical Elective Awards	April 1
Faculty of Law Awards	May 1
Undergraduate Awards for Continuing Students	August 1
Cumming School of Medicine Awards	August 10
Transfer Awards	October 1

Q.1.3 Awards Application Procedure

Award applications are available through the MyUofC portal (my.ucalgary.ca) and must be submitted by the respective deadlines. As part of the process of applying for admission, the University of Calgary issues a UCID number to each prospective student. This UCID number (or student ID) is required to apply for student awards. Admission to the University of Calgary is not required before applying for awards.

Q.1.4 Award Payment Information

With the exception of certain prizes and scholarships for graduating students, or if otherwise stated in the award conditions, payment of awards is contingent upon recipients maintaining full-time enrolment at the University of Calgary through the upcoming Fall and Winter Terms. Exceptions to these registration requirements are made for students participating in official exchanges and term abroad programs where tuition is paid to the University of Calgary.

Payment of tuition and fees is normally the first charge against undergraduate student awards.

For most award competitions, the award funds are split into two equal payments over Fall and Winter Terms and are automatically applied to outstanding tuition and fees. Excess award funds are processed on October 25 (Fall Term) and on February 25 (Winter Term) by direct deposit to the recipient's bank account. Award recipients must provide their banking information to the university through the MyUofC portal (my.ucalgary.ca).

Q.1.5 Policy and Regulations

Undergraduate awards are distributed equitably among the most deserving students, and adhere to the terms of reference.

If a student is granted an award, the University of Calgary reserves the right to release pertinent recipient information to award donors, high schools, provincial funding bodies, University of Calgary faculty and administrative offices and public news agents. Specific information may be used by the University for promotional purposes.

Award recipients who no longer meet the program/registration/course load requirements, due to extenuating circumstances, may wish to submit an official awards appeal. Contact the Student Awards Office directly by email: ucawards@ucalgary.ca.

Students with incomplete grades are not considered for awards.

The University of Calgary assumes liability for the payment of scholarships, bursaries, prizes and other awards only to the extent that gifts from donors or returns from investments for these purposes will permit.

Q.1.6 Award Competitions

Award competitions for entering or continuing undergraduate students at the University of Calgary are listed below.

- President's Admission Scholarships
- IB Diploma Scholarships
- High School Awards:
  - Seymour Schulich Academic Excellence Scholarships
  - Seymour Schulich Community Service/ Entrepreneurial Awards
  - Chancellor's Club Scholarships
  - Leader in Health Sciences Scholarships
  - High School Awards
- Transfer Awards
- Undergraduate Awards for Continuing Students
- Faculty of Veterinary Medicine Awards
- Cumming School of Medicine Bursaries
- Medical Elective Awards
- Athletic Awards
- Convocation Awards for Graduating Undergraduate Students

For a complete listing of undergraduate awards, including names, numbers, values and criteria, please visit ucalgary.ca/awards/view-awards.

President's Admission Scholarships

President's Admission Scholarships are offered to students admitted to the University of Calgary directly from high school on the basis of their high school grades and who are entering the first year of an undergraduate degree program in the Fall Term. Entering students with an admission average of 95.0% or higher are eligible to receive a President's Admission Scholarship valued at $4,000 (non-renewable).

Students entering the International Foundations Program (IFP), formerly English for Academic Purposes (EAP), are not eligible for these scholarships, and will be considered for awards prior to entering the fall term of the first year of an undergraduate degree program. These students must contact the Student Awards Office regarding their eligibility for awards.

Students entering the first year of an undergraduate degree program with transfer credit from either the University of Calgary or another post-secondary institution are not normally eligible for President's Admission Scholarships.

- Application: Not required. Students are considered automatically for these scholarships based on their admission average to the University of Calgary.
- Notification: Recipients are notified by email after their admission average is determined by the Admissions Office.
- Registration Requirement: Recipients must maintain full-time enrolment through the upcoming Fall and Winter Terms. Spring and summer courses are not used to reduce registration requirements.

IB Diploma Scholarships

IB Diploma Scholarships valued at $3,500 each are offered to students entering first year in any undergraduate degree program in the Fall term who are admitted directly from high school. The student must have completed an IB Diploma and achieved a minimum score of 35 to be eligible for consideration.

Students entering the first year of an undergraduate degree program with transfer credit from either the University of Calgary or another post-secondary institution are not normally eligible for these awards.

Students entering the International Foundations (IFP) program, formerly English for Academic Purposes (EAP), are not eligible for these awards.

Application: Not required. Students are considered automatically for these scholarships based on their final IB Diploma Score. Students are responsible for providing the Admissions Office with a transcript of International Diploma grades by August 1 of the year entering the University of Calgary.

Notification: Recipients are notified by email in August. Recipients are not required to accept their award through the MyUofC portal.

Registration Requirement: Recipients must maintain full-time enrolment through the upcoming Fall and Winter Terms. Spring and summer courses are not used to reduce registration requirements.

Seymour Schulich Scholarships and Awards

Seymour Schulich Academic Excellence Scholarships and the Seymour Schulich Community Service/Entrepreneurial Awards are prestigious renewable awards offered to students applying to the University of Calgary on the basis of their high school grades and entering the first year of a Bachelor of Science (BSc) degree program in the Schulich School of Engineering in the Fall Term.

Seymour Schulich Academic Excellence Scholarships are based on exceptional academic merit. Seymour Schulich Community Service/Entrepreneurial Awards are based on academic merit as well as contribution to school life, community service and/or entrepreneurial talent.

- Value: $12,400 for Calgary and area recipients; $24,800 for recipients from outside Calgary. Renewable.
- Eligibility: Open to high school students entering the first year in the Schulich School of Engineering in the Fall Term. Students entering International Foundations Program (IFP), formerly English for Academic Purposes (EAP), are not eligible for these awards, and should apply prior to entering the first year of an undergraduate degree program. The scholarship average is based on the final grades of four Grade 11 courses (or the final grades of four Grade 12 courses, if available).
- Application: Submit the High School Awards application, available November 1 through the MyUofC portal (my.ucalgary.ca). In submitting this application by the early deadline of December 15 (of the year prior to entering the University) applicants are considered for all competitive high school awards including Chancellor's Club Scholarships, the Seymour Schulich Academic Excellence Scholarships and the Seymour Schulich Community Service/Entrepreneurial Awards.
- **REMINDER:** As part of the process of applying for admission, the University of Calgary issues a UCID number to each prospective student. This UCID number (or student ID) is required to apply for student awards. Admission to the University of Calgary is not required before applying for awards.
- Notification: Recipients are notified by email in March, and must accept their award through the MyUofC portal (my.ucalgary.ca).
- Registration Requirement: Recipients must maintain full-time enrolment in the Schulich School of Engineering in a minimum of 30 units (5.0 full-course equivalents) through the upcoming Fall and Winter Terms.
- Payment: Award funds are split into two equal payments over Fall and Winter Terms and are automatically applied to outstanding tuition and fees.
- Renewability: Seymour Schulich Academic Excellence Entrance Scholarships are renewable at $12,400 or $18,500 annually in second and third year at the University of Calgary provided the student earns a minimum GPA of 3.50 on a minimum of 30 units (5.0 full-course equivalents) over the previous Fall and Winter Terms and completes a minimum of 30 units (5.0 full-course equivalents) in the upcoming Fall and Winter Terms in the Schulich School of Engineering.
- Seymour Schulich Community Service/ Entrepreneurial Entrance Awards are renewable at $12,400 or $18,500 annually in second and third year at the University of Calgary provided the student earns a minimum GPA of 2.70 on a minimum of 30 units (5.0 full-course equivalents) over the previous Fall and Winter Terms and completes in a minimum of 30 units (5.0 full-course equivalents) in the upcoming Fall and Winter Terms in the Schulich School of Engineering. These recipients must also provide the Schulich School of Engineering with evidence of their continued contribution to school life, community service and/or entrepreneurial activities.
- Spring and summer courses are not used to reduce course load requirements, nor are they used in calculating the GPA required for renewal.

Chancellor's Club Scholarships

Chancellor's Club Scholarships are prestigious renewable awards offered to students applying to the University of Calgary on the basis of their high school grades and enter-

ing the first year of an undergraduate degree program in the Fall Term.

- Value: $10,000. Renewable.
- Eligibility: Open to Canadian citizens or Permanent Residents entering the first year in any undergraduate degree program in the Fall Term.
- The scholarship average is based on the final grades of four Grade 11 courses (or the final grades of four Grade 12 courses, if available).
- Application: Submit the High School Awards application, available November 1, through the MyUofC portal (my.ucalgary.ca). In submitting this application by the early deadline of December 15 of the year prior to entering the University, applicants are considered for all competitive high school awards including Chancellor's Club Scholarships, Seymour Schulich Academic Excellence Scholarships, Seymour Schulich Community Service/Entrepreneurial Awards and the Leader in Health Sciences Scholarships.
- **REMINDER:** As part of the process of applying for admission, the University of Calgary issues a UCID number to each prospective student. This UCID number (or student ID) is required to apply for student awards. Admission to the University of Calgary is not required before applying for awards.
- Notification: Recipients are notified by email in March, and must accept their award through the MyUofC portal (my.ucalgary.ca).
- Registration Requirement: Recipients must maintain full-time enrolment in a minimum of 30 units (5.0 full-course equivalents) through the upcoming Fall and Winter Terms.
- Payment: Award funds are split into two equal payments over Fall and Winter Terms, and are automatically applied to outstanding tuition and fees.
- Renewability: Renewable at $10,000 in second, third and fourth year at the University of Calgary provided the student earns a minimum GPA of 3.60 on a minimum of 30 units (5.0 full-course equivalents) over the previous Fall and Winter Terms, and completes a minimum of 30 units (5.0 full-course equivalents) in the upcoming Fall and Winter Terms. Recipients must also provide the Student Awards Office with evidence of their continued contribution to school life and/or community service.
- Spring and summer courses are not used to reduce course load requirements, nor are they used in calculating the GPA required for renewal.

Leader in Health Sciences Scholarships

Leader in Health Sciences Scholarships are prestigious renewable awards offered to students applying to the University of Calgary on the basis of their high school grades and who are entering the first year of the Bachelor of Health Sciences degree program in the Cumming School of Medicine in the Fall Term.

- Value: $15,000 and assured admission to the MD program upon completion of the Bachelor of Health Sciences program. Renewable.
- Eligibility: Open to Canadian citizens or Permanent Residents entering the Bachelor of Health Sciences degree program in the Cumming School of Medicine in the Fall Term.
- The scholarship average is based on the final grades of four Grade 11 courses (or the final grades of four Grade 12 courses, if available).
- Application: Submit the High School Awards application, available November 1 through the MyUofC portal (my.ucalgary.ca). In submitting this application by the early deadline of December 15 of the year prior to entering the University, applicants are considered for all competitive high school awards including the Chancellor's Club Scholarships. Submit the Bachelor of Health Sciences (BHSc) Supplementary Admission Application by January 5.
- **REMINDER:** As part of the process of applying for admission, the University of Calgary issues a UCID number to each prospective student. This UCID number (or student ID) is required to apply for student awards. Admission to the University of Calgary is not required before applying for awards.
- Notification: Recipients are notified by email in March, and must accept their award through the MyUofC portal (my.ucalgary.ca).
- Registration Requirement: Recipients must maintain full-time enrolment in the Bachelor of Health Sciences program in a minimum of 30 units (5.0 full-course equivalents) through the upcoming Fall and Winter Terms.
- Payment: Award funds are split into two equal payments over Fall and Winter Terms, and are automatically applied to outstanding tuition and fees.
- Renewability: Renewable at $15,000 in second, third and fourth year at the University of Calgary provided the student earns a minimum GPA of 3.40 on a minimum of 30 units (5.0 full-course equivalents) over the previous Fall and Winter Terms, and completes a minimum of 30 units (5.0 full-course equivalents) in the upcoming Fall and Winter Terms. Recipients must also provide the Cumming School of Medicine with evidence of their continued contribution to school life and/or community service.
- Spring and summer courses are not used to reduce course load requirements, nor are they used in calculating the GPA required for renewal.

High School Awards

The University of Calgary offers scholarships and bursaries to students applying to the University on the basis of their high school grades.

- Value: $500 - $10,000.
- Eligibility: Open to students entering first year in an undergraduate degree program in the Fall Term. Students entering the International Foundations (IFP) program, formerly English for Academic Purposes (EAP), are not eligible for these awards, and should apply prior to entering the first year of an undergraduate degree program. The scholarship average is based on the final grades of four Grade 11 courses (or the final grades of five Grade 12 courses, if available).
- Application: Competitive awards: Submit the High School Awards application, available November 1 through the MyUofC portal (my.ucalgary.ca).
- There are **two deadlines** for the High School Awards competition:
- **EARLY DEADLINE:** December 15, 2016 (the year prior to entering the University). Students who apply by the early deadline are considered for all high school awards including Chancellor's Club Scholarships, Seymour Schulich Academic Excellence Scholarships, Seymour Schulich Community Service/Entrepreneurial Awards and the Leader in Health Sciences Scholarships.
- **FINAL DEADLINE:** March 1, 2017. Students who apply between December 16, 2016 and March 1, 2017 are considered for all high school awards excluding Chancellor's Club Scholarships, Seymour Schulich Academic Excellence Scholarships, Seymour Schulich Community Service/Entrepreneurial Awards and the Leader in Health Sciences Scholarships.
- Nominated awards: No application required. Recipients are nominated by their faculties and departments.
- **REMINDER:** As part of the process of applying for admission, the University of Calgary issues a UCID number to each prospective student. This UCID number (or student ID) is required to apply for student awards. Admission to the University of Calgary is not required before applying for awards.
- Notification: Recipients are notified by email at the end of May. Recipients are not required to accept their award.
- Registration Requirement(s): Recipients are required to be registered full-time at the University of Calgary for the Fall Term by August 15, 2017 and must maintain full-time enrolment through the upcoming Fall and Winter Terms.
- Payment: Award funds are split into two equal payments over Fall and Winter Terms, and are automatically applied to outstanding tuition and fees.

Transfer Awards

The University of Calgary offers transfer scholarships and bursaries to:

Students newly admitted to the University of Calgary in the Fall Term, and who are receiving a minimum equivalent of 24 units

(4.0 full-course equivalents) of transfer credit completed at another post-secondary institution. Selections are based on the final admission average calculated by the Admissions Office.

Students returning to the University of Calgary after attending another post-secondary institution as a visiting or exchange student, and who are receiving a minimum equivalent of 24 units (4.0 full-course equivalents) of transfer credit. Selections are based on the grade equivalents received from the host institution.

- Eligibility: Open to students with a minimum equivalent of 24 units (4.0 full-course equivalents) of transfer credit from another post-secondary institution who are admitted to the University of Calgary in the Fall Term or to students returning to the University of Calgary after attending another post-secondary institution for a full academic year as a visiting or exchange student. Transfer courses that are extra to the degree are not included in the minimum equivalent transfer credit required. Students must be pursuing their first undergraduate degree.
- Application: Submit the Transfer Awards application, available September 1, 2016 through the MyUofC portal (my.ucalgary.ca).
- **DEADLINE: October 1, 2016**.
- Notification: Recipients are notified by email at the end of November.
- Registration Requirement: Recipients must maintain full-time enrolment through the upcoming Fall and Winter Terms.
- Payment: Award funds are applied automatically to Winter Term tuition and fees.

Undergraduate Awards for Continuing Students

The University of Calgary offers scholarships and bursaries to students continuing in their undergraduate degree program.

Eligibility: Open to students continuing in their undergraduate degree program after successfully completing the previous Fall and Winter Terms as a full-time student at the University of Calgary. A minimum GPA of 3.20 is required for scholarships and 2.60 for bursaries. The majority of these awards require the completion of a minimum of 24 units (4.0 full-course equivalents) of academic course work; applicants with a verifiable permanent disability are considered for these awards upon completion of a minimum of 18 units (3.0 full-course equivalents) of academic course work.

Spring and summer courses are not used in the calculation of a scholarship average for awards purposes, nor can they be used to reduce course load requirements.

Students who participated in a co-op work term offered by the University of Calgary in either the Fall Term or Winter Term may be eligible to apply for these awards; please contact the Student Awards Office (ucawards@ucalgary.ca) to verify eligibility requirements.

Students participating in a 12- or 16-month internship offered by the University of Calgary are eligible to apply for these awards just prior to returning to full-time study at the University of Calgary. Grades earned in the previous Fall and Winter Terms before the start of the internship are used to calculate a scholarship average. Students are also eligible to be considered for nominated awards (including those requiring an application to the faculty or department) before starting their internship period.

University of Calgary students who participated in an official exchange program in either the previous Fall Term or Winter Term are eligible to apply for these awards. Transferable courses from the host institution are combined with those from the University of Calgary to calculate a scholarship average. Students who participated in an official exchange over both terms are not eligible. However, these students may be eligible to apply for Transfer Awards upon returning to the University of Calgary.

University of Calgary students who attended another post-secondary institution in either the previous Fall Term or the previous Winter Term, and did not participate in an official exchange, are not eligible for these awards.

Students entering the first year of an after-degree program are not eligible for these awards. However, these students are encouraged to apply after completing a minimum of one year of the after-degree program.

Students with a previous degree who are entering the Doctor of Veterinary Medicine (DVM) program are not eligible. DVM students should apply after completing their first year of full-time studies in the Faculty of Veterinary Medicine. Please see the section in these pages entitled “Faculty of Veterinary Medicine Awards” for more information.

Students with a previous degree who are enrolled in the Faculty of Law JD program are not eligible. JD students should apply for Faculty of Law Awards. Please see the section in these pages entitled “Faculty of Law Awards” for more information.

Students with a previous degree who are enrolled in the Doctor of Medicine (MD) program are not eligible. MD students should apply for Cumming School of Medicine Awards. Please see the section in these pages entitled “Cumming School of Medicine Awards” for more information.

Application:

- **Competitive awards:** Submit the Continuing Undergraduate Awards application, available June 1, 2016 through the MyUofC portal (my.ucalgary.ca). **DEADLINE: August 1, 2016**.

Notification: Recipients are notified by email at the end of November.

Payment: Award funds are paid automatically to a student’s outstanding Winter tuition and fees.

- **Nominated awards:** No application required. Recipients are nominated by their faculty and department.

Notification: Recipients are notified by email at the end of July.

Payment: Award funds are split into two equal payments over Fall and Winter Terms and are applied automatically to outstanding tuition and fees.

Registration Requirement: Competitive and Nominated award recipients must maintain full-time enrolment through the upcoming Fall and Winter Terms. Exceptions may be made for students completing their degree in the upcoming academic year.

Q.1.7 Faculty of Veterinary Medicine Awards

The University of Calgary offers scholarships and bursaries to students enrolled in the Doctor of Veterinary Medicine (DVM) program in the Faculty of Veterinary Medicine.

- Eligibility: Open to students entering or continuing in the Doctor of Veterinary Medicine program at the University of Calgary. Students entering the first year of the program are eligible for nominated awards only. Students continuing in second, third or fourth year are eligible for nominated awards and competitive undergraduate awards, which require an award application.
- Application: Submit the Continuing Undergraduate Awards application available June 1, 2016 through the MyUofC portal (my.ucalgary.ca).
- **DEADLINE: August 1, 2016**.
- Nominated awards: No application required. Recipients are nominated by the faculty.
- Notification: Recipients are notified by email for nominated awards in August; for competitive awards at the end of November.
- Registration Requirement: Recipients must maintain full-time enrolment in the Faculty of Veterinary Medicine through the upcoming Fall and Winter Terms. Exceptions may be made for students who are completing their degree in the upcoming academic year.
- Payment: Nominated award funds are split into two equal payments over Fall and Winter Terms and are applied automatically to outstanding tuition and fees. Competitive award funds are paid to a student’s Winter Term tuition and fees.

Q.1.8 Faculty of Law Awards

The University of Calgary offers scholarships, awards and bursaries to students enrolled in the Faculty of Law JD program.

- Eligibility: Open to students entering or continuing in the Faculty of Law JD program at the University of Calgary.
- Application: Competitive awards: Submit the Faculty of Law Awards application, available February 1, 2016 through the MyUofC portal (my.ucalgary.ca).
- **DEADLINE: May 1, 2016**.
- Students who complete the Law Awards application are also considered for Differential Tuition Bursaries, based on

financial need. Applicants must complete the financial information section of the awards application. To be eligible for a Differential Tuition Bursary, a student must be paying the differential tuition fee to the Faculty of Law for the academic year in which the bursary is awarded.

- Nominated awards: No application required. Recipients are nominated by the faculty.
- Notification: Award recipients are notified by email in July; Differential Tuition Bursaries recipients are notified in August by the Student Awards Office.
- Registration Requirement: Recipients must maintain full-time enrolment in the Faculty of Law through the upcoming Fall and Winter Terms.
- Payment: Award funds are split into two equal payments over Fall and Winter Terms, and are automatically applied to outstanding tuition and fees. Award values stated as 'tuition and fees' do not include differential fees.

Q.1.9 Cumming School of Medicine Bursaries

Q.1.9.1 Bursaries

The University of Calgary offers bursaries to students enrolled in the Doctor of Medicine (MD) program in the Cumming School of Medicine.

Students wishing to apply for the competitive Medical Elective Awards submit a separate application; refer to the "Medical Elective Awards" section in this Calendar for details.

- Eligibility: Open to students entering or continuing in the Doctor of Medicine (MD) program at the University of Calgary.
- Students in year two or three of the Doctor of Medicine program must be in satisfactory academic standing to be eligible for these awards.
- Students entering the Bachelor of Health Sciences or Bachelor of Community Rehabilitation program (admitted on the basis of their high school grades) are not eligible for these awards and should apply for High School Awards (refer to the "High School Awards" section of this Calendar for details).
- Students continuing in the Bachelor of Health Sciences or Bachelor of Community Rehabilitation program are not eligible for these awards and should apply for Undergraduate Awards for Continuing Students (refer to the "Undergraduate Awards for Continuing Students" section of this Calendar for details).
- Application: Competitive awards: Students must submit the Cumming School of Medicine Bursaries application, available June 1, 2016 in the online Student Centre through the MyUofC portal (my.ucalgary.ca).
- **DEADLINE: August 10, 2016**.
- Students who complete the Medicine Bursaries application are also considered for Differential Tuition bursaries, provided the applicant submits proof of all outstanding government student loans. To be eligible for a Differential Tuition Bursary, a student must be paying the differential tuition fee to the Cumming School of Medicine for the academic year in which the Differential Tuition Bursary is awarded.
- Nominated awards: No application required. Recipients are nominated by the faculty.
- Notification: Recipients are notified by email for nominated awards in July; for competitive awards and Differential Tuition Bursaries at the end of August by the Student Awards Office.
- Registration Requirement: Recipients must maintain full-time enrolment in the Doctor of Medicine program.
- Payment: Award funds are split into two equal payments over Fall and Winter Terms, and are automatically applied to outstanding tuition and fees. Award values stated as 'tuition and fees' do not include differential tuition fees.

Q.1.9.2 Medical Elective Awards

The University of Calgary offers awards to students enrolled in the Doctor of Medicine (MD) program in the Cumming School of Medicine who are participating in a medical elective.

- Eligibility: Open to students continuing in the Doctor of Medicine (MD) program who are participating in a medical elective approved by the Undergraduate Medical Education (UME) office.
- Application: Submit the Medical Elective Awards application, available February 1, 2016 through the MyUofC portal (ucalgary.ca).
- **DEADLINE: April 1, 2016.**
- Notification: Recipients are notified by email in May.
- Registration Requirement(s): Recipients must maintain enrolment in the Doctor of Medicine program. Confirmation of completion or approval of the elective(s) must be received from the Office of Undergraduate Medical Education (UME) before the award payment is processed. The Student Awards Office (ucawards@ucalgary.ca) must be advised regarding any changes to the location, date and/or discipline of the elective(s). The elective must be a minimum of two weeks in duration.
- Payment: Award funds are paid directly to the student once the Office of Undergraduate Medical Education (UME) confirms completion or approval of the elective(s).

Q.1.10 Athletic Awards

The University of Calgary offers awards to student athletes enrolled full-time who are participating on Dinos athletic teams. Student athletes may be eligible for other awards at the University of Calgary – please refer to the academic award categories listed elsewhere in this Calendar.

Athletic Awards are offered annually and are subject to Canadian Interuniversity Sport (CIS) regulations. For further information, contact the Director of Athletics, Faculty of Kinesiology (knesinfo@ucalgary.ca).

Eligibility:

Entering student athletes: Students entering an undergraduate degree program in the Fall Term at the University of Calgary directly from high school must have a final admission average of 80.0 per cent or greater on a minimum of 18 units of transfer credit, as calculated by the Admissions Office.

Entering students who are officially transferring into a recognized University of Calgary undergraduate degree program from another post-secondary institution must have an official transfer GPA of 2.00 or greater, as calculated by the Admissions Office.

Students in their first year of studies in an undergraduate degree program at the University of Calgary who do not meet either of the above two requirements may be nominated in May of year one to receive a "First Year Athletic Award." To be eligible, a minimum GPA of 2.00 completed on at least 18 units (3.0 full-course equivalents) taken at the University of Calgary over the previous Fall and Winter Terms is required.

Continuing student athletes: Non-entering students continuing in a recognized undergraduate degree program (years two, three, four, etc.) must have earned a minimum GPA of 2.00 on at least 18 units (3.0 full-course equivalents) completed at the University of Calgary over the previous Fall and Winter Terms.

Visiting students or students attending the University of Calgary on a Letter of Permission from another university are not eligible for University of Calgary Athletic Awards.

Student athletes who participate in Coop work terms are encouraged to contact the Student Awards Office directly (ucawards@ucalgary.ca) in advance of their work term for information about qualifying for athletic awards. Eligibility varies on a case by case basis.

Application:

An awards application is not required. The Student Awards Office, in consultation with the Department of Athletics, receives and approves the nominations for these awards from coaches of Dinos athletic teams. Please contact the Student Awards Office for additional questions about the process or eligibility requirements.

Grades from courses completed in the Spring and Summer Intersession are not used by the Student Awards Office in calculating the GPA requirements for receiving an Athletic Award, nor can they be used to reduce course load requirements.

Notification: Successful recipients (continuing students) are notified by email from the Student Awards Office in January; successful recipients of the First Year Athletic Awards are notified by the Student Awards Office in June, at the end of their first year of studies.

Registration Requirement: Recipients must maintain full-time enrolment (minimum of 9 units (3 courses) per term) at all times during the immediate Fall and Winter Terms. Student athletes enrolled for one term only are not eligible for athletic awards.

Payment: With the exception of the Athletic First Year Awards, which are paid directly to the recipients at the end of June, award payments are automatically applied to outstanding Winter Term tuition and fees. Excess award funds are processed by the end of February (Winter Term) and are deposited into the student's bank account. Award recipients must provide their banking information to the University through the MyUofC portal (my.ucalgary.ca). Award values stated as 'tuition and fees' do not include differential tuition fees. **Student athletes are responsible for paying tuition and fees in full by the specified Fall and Winter Term deadlines. Fee deferrals are not available to student athletes anticipating receipt of awards**.

Q.1.11 Awards for Graduating Students

Convocation Awards for Undergraduate Students

Medallions presented at convocation are among the most prestigious of university awards. These awards reflect the highest academic distinction earned by a student in a particular discipline.

Medallions are presented at the spring convocation ceremonies in June, with the exception of the University of Calgary-Qatar medallions, which are presented at the fall convocation ceremony in November. Students who graduated at the previous fall convocation ceremony are considered for convocation medallions on the same basis as those who graduate at spring convocation.

Gold Medallions: Each faculty awards one gold medallion to the student graduating with the highest distinction in scholarship.

Silver Medallions: Each department (or equivalent unit) awards one silver medallion to the student graduating with the highest distinction in scholarship in their program.

Eligibility: For students completing their undergraduate degree program requirements with academic excellence at the University of Calgary. Each faculty and department determines its own definition of academic excellence and establishes guidelines for the selection of medallion recipients, with consideration to the following criteria:

- Grade point average
- Course load
- Minimum number of University of Calgary courses taken

Application: No application required. Students are nominated by their faculties. It is the responsibility of the University's undergraduate Awards Office Committee in Enrolment Services to select recipients for the Governor General's Silver Medallions, the Muriel Kovitz Prize, and the Lieutenant Governor's Gold Medallion.

Notification: Recipients of convocation awards are notified by email at the end of May by the Student Awards Office.

Payment: Convocation awards with a monetary value are paid by direct deposit to the students' bank accounts at the end of June. To receive payment, award recipients must provide their banking information to the University of Calgary through the MyUofC portal (my.ucalgary.ca).

Q.2 Graduate Studies Awards

See the Faculty of Graduate Studies website. Information concerning Graduate Studies Awards can be found at: grad.ucalgary.ca/awards.

Q.3 Financial Assistance

Q.3.1 Government Student Loans

The Financial Aid office facilitates the confirmation and disbursement of approved government student loans to enable students to receive their funding.

Student loans are available to Canadian citizens or permanent residents who are studying full- or part-time in a degree-granting program.

Students apply for loans through their home province/territory of residence (not the province where you will be attending university) and are considered for both federal and provincial loans and a variety of grants. Applications become available online in mid-June for any program starting on or after August 1st of the same year. Loan applications take 4-6 weeks to process.

Loans: are determined and awarded based on financial need. Loans remain interest free while studying full-time but must be repaid upon graduation or any break in study longer than 6 months.

Grants: are determined and awarded based on financial need and other criteria. Grant eligibility is automatically assessed with a student loan application. Grants do not have to be repaid.

Alberta Students

Alberta residents who require financial assistance to pursue post-secondary education may obtain student loans by applying online through Student Aid Alberta. Students submit one loan application and may be eligible to receive any combination of Federal loans, provincial loans and grants.

Students with questions about loan eligibility and the application process can contact Student Aid Alberta directly for more information.

Student Aid Alberta

Box 28000 Station Main

Edmonton, AB T5J 4R4

Telephone: 1-855-606-2096

Website: studentaid.alberta.ca

Out-of-Province Students

Students who reside in a province other than Alberta are eligible for government student loan funding and can apply through their home province or territory of residence. Students submit one loan application and may be eligible to receive any combination of Federal loans, provincial loans and grants.

Students with questions about loan eligibility and the application process can contact their provincial loan office directly for more information. Additional information can also be found on the Federal CanLearn website.

National Student Loan Service Centre (NSLSC)

PO Box 4030

Mississauga, ON L5A 4M4

Telephone: 1-888-815-4514

Website: canlearn.ca.

Part-Time Students

The Federal government offers loan and grant funding options for part-time students. Loans are interest bearing and can be approved to cover tuition, general fees, books and supplies (educational costs) only. Federal grants for high need part-time students are awarded on the basis of financial need and provide for tuition, fees, books, transportation, child care and incidentals. Visit the Federal CanLearn website for more information (canlearn.ca).

Additionally, Alberta loan borrowers can access a provincial grant of up to $600.00 per academic term. These grants are awarded to Alberta residents on the basis of financial need, and are intended to help cover the costs of tuition, books, child care and travel if required. Students must apply using a paper loan application and must have the University of Calgary complete one section of the application before it can be submitted to Student Aid Alberta for consideration. Visit the Student Aid Alberta website for more information and to obtain a paper application (studentaid.alberta.ca).

For all other provinces, part-time student loans may be available. Please contact your provincial lender for further information.

Q.3.1.1 Loan Confirmation and Disbursements

Once approved, all students are notified of loan disbursement amounts and dates from their lender in writing. Student loan borrowers are encouraged to review this information carefully to ensure that any approved loan amounts or disbursement dates conform to the University of Calgary's published fee deadlines. Regardless of method of payment, all students must ensure they arrange to pay tuition and fees by the deadline.

At the time of confirmation, the Financial Aid Office will remit funds from the loan to pay tuition, fees and any outstanding (past due) balance at the time of confirmation. Students receiving multiple loan disbursements for the loan study period may have current term fees remitted from the loan to cover these educational costs. Students receiving only one loan disbursement for the loan study period may have both term fees remitted from the loan. All loan borrowers are responsible for monitoring the Student Centre when expecting a loan disbursement to ensure that all tuition and fee balances

are paid in full by the fee deadline. If there are excess funds applied to a student account, a refund request form is available at ucalgary.ca/registrar/fees/refunds. If there are excess funds on a student's account and the terms of the loan agreement have been breached, the credit will be refunded to the loan provider.

Students with a confirmed loan agreement prior to the published fee deadline receive an automatic 30-day fee deferral. Any outstanding balance remaining after 30 days is subject to late interest and terms in accordance with the University of Calgary fee policy (see the Tuition and General Fees section of the Calendar).

Q.3.1.2 Maintaining Previous Loans

Previously borrowed full-time student loans remain interest and payment free while studying full-time, even if student does not borrow subsequent loans. To ensure that interest-free status continues during full-time study, students must provide adequate proof of enrolment to their lenders. Students who will be borrowing full-time student loans do not need to submit interest-free documents to their lenders. Part-time students who are repaying previous Alberta student loans may reinstate their Alberta loans to interest-free status. Interest-free status can only be requested for a current study period and cannot be completed retroactively.

Borrowers from the following provinces who are studying full-time: AB, SK, BC, NFL, NB, NS, PEI (federal loans only), MB (federal loans only) and YK may request the school to update their interest-free status electronically. To request confirmation of enrolment to update interest-free status electronically:

1. Create an Online Services account with NSLSC/Log on to your NSLSC online account at nslsc.canlearn.ca/eng/default.aspx.
2. Select the "Confirmation your Enrolment" link on the left hand bar.
3. Follow the prompts/fill out all applicable information.
4. Submit your request.

Requests will come through to the Financial Aid Office and full-time status will be verified.

For all other provinces and Alberta borrowers who are studying part-time, for each academic year, interest-free status forms must be filled out at Enrolment Services (MB 117). Interest-free status can only be confirmed 30 days prior to the start of a study period (with the exception of BC (interest-free status can be confirmed 26 days prior to the start of a study period) and Ontario (interest-free status can be confirmed on the first day of the study period)).

Q.3.1.3 Loan Repayment

Student loan repayment begins six months after a borrower ceases full-time studies. Repayment is managed by the student and co-ordinated with the lender(s) who provided the student loan funding.

If a borrower is having difficulties repaying their student loans they should contact their lender(s) immediately. Borrowers may qualify for a repayment assistance plan to help them avoid defaulting on their loan repayment agreement.

Repayment Assistance Plan (RAP)

The Repayment Assistance Plan is provided to assist students in keeping their student loan debt at a manageable level. The Repayment Assistance Plan is offered for both Canada and Alberta student loans. The plan provides students with short-term assistance if they have temporary financial challenges and long-term support if they have persistent financial challenges. Students can apply for RAP at any time during their repayment term. If students are approved for RAP on their Canada student loans, they are automatically approved for RAP on their Alberta student loans. For more information contact the National Student Loan Service Center at 1-888-815-4514 or visit: studentaid.alberta.ca/repaying-your-loan/repayment-options/ or canlearn.ca/eng/after/repaymentassistance/rpp.shtml.

Q.3.2 U.S. Student Loans

Students who are citizens or permanent residents of the United States have several funding options while attending the University of Calgary. Students who are dual citizens of Canada and the United states are encouraged to explore opportunities through the Canada Student Loans (canlearn.ca) program first.

For more information please visit our website at ucalgary.ca/studentfinance or email usloans@ucalgary.ca.

William D. Ford Federal Direct Loans

As a Title IV eligible foreign school, University of Calgary is able to facilitate the disbursement of four types of loans under the Direct Loans Program.

- **Direct Subsidized Loans** are loans made to eligible undergraduate students who demonstrate financial need to help cover the costs of higher education at a college or career school.
- **Direct Unsubsidized Loans** are loans made to eligible undergraduate, graduate, and professional students, but in this case, the student does not have to demonstrate financial need to be eligible for the loan.
- **Parent PLUS Loans** are loans made to parents of dependent undergraduate students to help pay for education expenses not covered by other financial aid.
- **Graduate PLUS Loans** are loans made to graduate or professional students to help pay for education expenses not covered by other financial aid.

Students must first establish eligibility by completing a Free Application for Student Financial Assistance (FAFSA) on the Federal Student Aid website (fafsa.ed.gov). Once complete, students must submit a Direct Loans application to the Financial Aid Office for funding approval.

Sallie Mae

Students who are ineligible for Direct Loans, or who need to borrow additional funding to meet the cost of attendance can apply for a Sallie Mae Smart Option Student Loan.

For more information please visit our website at ucalgary.ca/studentfinance.

Veterans Affairs Funding (GI Bill)

The University of Calgary supports veterans of the U.S. Armed Forces in obtaining their GI bill benefits while attending studies.

All programs must be approved through the Department of Veterans Affairs before a student is eligible for funding. As this process can take up to six months, VA funded students who have applied to the University of Calgary are encouraged to contact the U.S. Financial Aid Office as soon as possible.

For more information please visit our website at ucalgary.ca/studentfinance or contact the U.S. Financial Aid Office at usloans@ucalgary.ca.

Q.3.3 Student Budgeting

For the purposes of determining financial aid eligibility, the government uses a set standard of living costs for rent, utilities, food and clothing for each month of full-time study in the loan study period. In addition, educational expenses (tuition, fees, books and supplies) are calculated for the loan study period. Resources such as savings, part-time earnings, scholarships or bursaries, parental assistance, investment income, etc. may be used in calculating loan eligibility. Many provinces have an expected student contribution (resource) amount, regardless of actual contribution. All students are expected to have a financial plan (budget) in place for covering all necessary living and educational expenses before commencing studies. It is the students' responsibility to plan to meet all expenses not fully covered by approved student loan funding. Visit Enrolment Services (MB 117) to access a variety of budgeting tip sheets and handbooks, or visit: alis.alberta.ca/pdf/cshop/StretchYourDollars.

Any student who experiences an unexpected emergency expense or extenuating circumstance beyond their control that precludes them from meeting their pre-established financial plan while in studies should visit Enrolment Services (MB 117) to explore temporary emergency funding options, such as an Emergency Loan.

International Foundations Program

The International Foundations Program (IFP), formerly English for Academic Purposes (EAP), offers intensive English Language programming designed to prepare academically-qualified students whose native language is not English for study in the University of Calgary's degree or diploma programs. IFP is intended for prospective international, Permanent Resident or Canadian students whose level of English Language Proficiency (ELP) is at a high-intermediate to advanced level. IFP is not designed for beginners. Academically-qualified students admitted to the University of Calgary can apply for admission to one of three streams of IFP:

A. The **IFP Pathways** stream offers English language courses concurrently with first-year core degree program courses.

OR

B. The **IFP Bridging** stream is for those students accepted to their faculty/departments on the condition that they demonstrate English Language Proficiency.

OR

C. The **IFP Preparation** stream allows students to register as an Open Studies student to develop English proficiency for other purposes. These include students who wish to apply for admission to a degree program, students who wish to upgrade their language skills, or students who missed the application deadline for the IFP Bridging stream.

R.1 Program Structure

See the International Foundations Program Options diagram.

R.2 Language Assessment

An IFP Language Assessment is conducted in order to determine placement within the program.

A. **IFP Pathways** students will not participate in internal IFP placement testing. Requirements for English Language Proficiency are met by external assessments listed in Admission Requirements.

Schulich School of Engineering admission requirements must also be met, and may be found at: ucalgary.ca/pubs/calendar/current/en-3-1.html.

B. **IFP Bridging** students will be assessed by IFP at the beginning of each term. Results from internal IFP placement testing will then place all IFP Bridging students into the appropriate courses of the program (Tiers 1-3). IFP Bridging students whose placement test results indicate placement below IFP Bridging Tier 1 will have their admission to their degree program rescinded but may choose to apply to IFP Preparation to achieve ELP requirements. Students must be present for the language assessment prior to the start of scheduled classes. If unable to attend, students must notify the IFP Academic Co-ordinator (ifp@ucalgary.ca). Failure to notify the Co-ordinator will result in cancellation of their acceptance into the IFP Bridging stream. Additionally, students applying to IFP Bridging must meet the admission requirements of the faculty to which they are applying. Students requiring letters of acceptance for immigration purposes are strongly encouraged to apply early due to varying processing times required by Canadian Immigration in each country.

C. **IFP Preparation** students will be assessed by IFP at the beginning of each term. Results from internal IFP placement testing will then place all IFP Preparation students into the appropriate courses of the stream (Tiers 1-3).

Students must be present for the language assessment prior to the start of scheduled classes. If unable to attend, students must notify the IFP Academic Co-ordinator (ifp@ucalgary.ca). Failure to notify the Co-ordinator will result in cancellation of their acceptance into the IFP Preparation stream. Students requiring letters of acceptance for immigration purposes are strongly encouraged to apply early due to varying processing times required by Canadian Immigration in each country.

R.3 International Foundations Program Fees

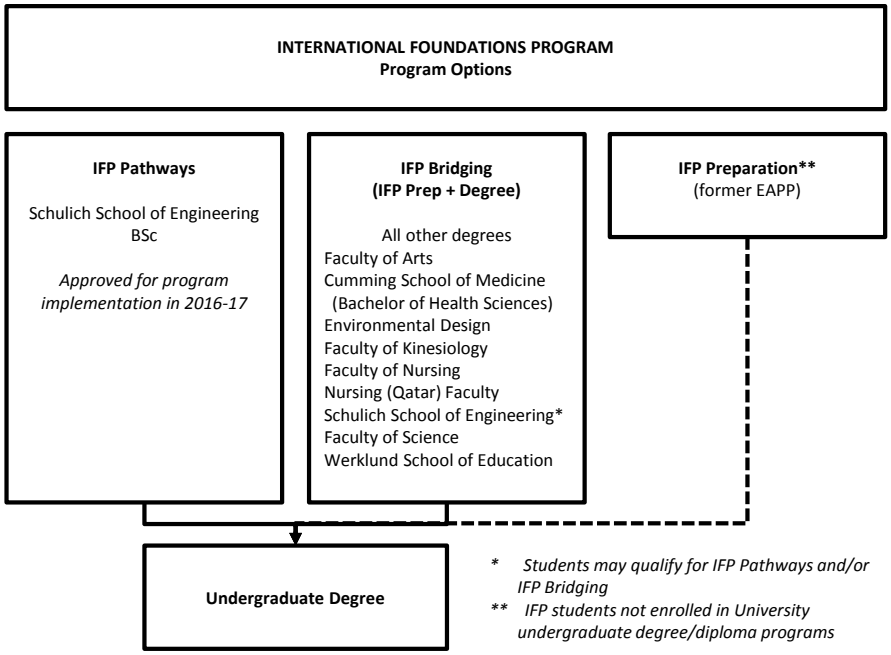
A. IFP Pathways

Regular tuition and general fees apply for all academic program requirements. For detailed information on tuition fees see section P (Undergraduate Tuition and General Fees).

B. IFP Bridging

All IFP Bridging students will be charged the IFP tuition rate for IFPX courses. Please see section P (Undergraduate Tuition and General Fees).

Applicants will be required to pay a $250.00 CDN non-refundable mandatory IFP Language Assessment Fee.



C. IFP Preparation

All IFP Preparation students will be charged the IFP tuition rate for IFPX courses. Please see section P (Undergraduate Tuition and General Fees).

Applicants will be required to pay a $250.00 CDN non-refundable mandatory IFP Language Assessment Fee.

R.4 Program Structure

R.4.1 IFP Pathways Stream with the Schulich School of Engineering

Students admitted to IFP Pathways complete a structured program including Schulich School of Engineering courses combined with intensive English language support.

IFP Pathways students will take first-year core engineering courses (60 units or 10.0 full-course equivalents) within the Schulich School of Engineering, concurrently with English language support courses within the IFP over a two-year period. IFP Pathways students' language support will consist of:

- 4 academic language instructional courses (International Foundations Program, IFPX)
- 10 "adjunct" language support courses (International Foundations Program Engineering, IFPE) specific to the courses in the Schulich School of Engineering first-year program

Students admitted to IFP Pathways must complete IFP Pathways and cannot submit English language proficiency scores for early exit.

Please refer to the Schulich School of Engineering section of the Calendar for detailed program of studies.

R.4.2 IFP Bridging Stream

A student may be admitted to an undergraduate degree or diploma program with the requirement that the student successfully completes IFP Bridging Tier 3 courses. Students normally have 12 months to complete IFP Bridging or they will lose their degree/diploma admission. Students will be placed in Tier 1, 2 or 3 based on the IFP Language Assessment. Students whose Language Assessment results place them below Tier 1 will lose their degree/diploma admission immediately.

Each Tier (1-3) consists of 13 weeks (approximately 260 hours) of classroom instruction, including formative and summative assessments. All Tier 1 and Tier 2 courses are corequisites and must be taken as a group; however, students who do not successfully complete any component of Tier 3 will be required to complete only the unsuccessful component. IFP Bridging students enrolled in IFP Bridging Tier 3 may pre-register for degree credit courses offered in the next term.

IFP Bridging – Course Sequence		
Tier 1	**Tier 2**	**Tier 3**
IFPX 270 Academic Writing and Grammar	IFPX 280 Academic Writing and Grammar	IFPX 290 Academic Writing and Grammar
IFPX 273 Reading Comprehension and Proficiency	IFPX 283 Reading Comprehension and Proficiency	IFPX 293 Reading Comprehension and Proficiency
IFPX 277 Listening Comprehension and Oral Fluency	IFPX 287 Listening Comprehension and Oral Fluency	IFPX 297 Listening Comprehension and Oral Fluency

All IFP Tier 1 and 2 students who achieve a grade of "C" or better in all three courses of the tier will be permitted to advance to the next tier. Students who achieve a grade of "C-" or lower in one or more courses in any tier will be required to repeat and successfully complete all courses of the tier before advancing to the next tier. All students are permitted to take corequisite tier courses twice. After two unsuccessful attempts to complete corequisite tier courses, students must retake the IFP Language Assessment and pay the $250.00 CDN fee which will indicate appropriate tier placement for the student.

If a student does not complete IFP Bridging Tier 3 successfully or meet the University's ELP requirement, registration in credit courses in the next term will be cancelled, and admission to the degree/diploma program rescinded. These students must reapply and meet criteria for admission to a degree program in a future term.

Students are advised that grades for IFP Bridging courses are not used in the calculation of grade point averages for the purposes of the official transcript. In addition, IFP Bridging courses may not be used for credit toward a degree or diploma program. Students are also advised that faculty requirements for continuation in a degree/diploma program may be significantly different than those for the IFP Bridging program. Students must refer to the appropriate program sections of this Calendar for specific promotion and graduation requirements.

R.4.3 IFP Preparation Stream

IFP students not enrolled in University undergraduate degree/diploma programs:

IFP students may register as Open Studies students to study in the IFP Preparation stream. Students registered in IFP Tier 3 are, however, permitted to register in one credit course per term with approval of the IFP Co-ordinator.

If students are also interested in seeking admission to a degree/diploma program at the University, they must complete an Application for Admission to that program by the appropriate deadline (see A.4.1 Application for Admission in this Calendar) in addition to submitting all required documentation in support of their application. Successful completion of IFP Preparation Tier 3 can be used to satisfy the English Language Arts 30-1 requirement for admission purposes.

Completion of this requirement is valid only for University of Calgary programs and applicants must meet the deadline dates for admission to a degree/diploma program.

The University of Calgary will accept Open Studies applications for Admission to IFP Preparation for Fall (September), Winter (January), and the combined Spring/Summer Intersession.

Each Tier (1-3) consists of 13 weeks (approximately 260 hours) of classroom instruction, including formative and summative assessments. Students who place into IFP Preparation Tier 1 courses normally take one year to complete the entire IFP Preparation stream. All Tier level courses must be taken together (considered corequisites). The following chart outlines the requirements for each Tier:

IFP Preparation – Course Sequence		
Tier 1	**Tier 2**	**Tier 3**
IFPX 270 Academic Writing and Grammar	IFPX 280 Academic Writing and Grammar	IFPX 290 Academic Writing and Grammar
IFPX 273 Reading Comprehension and Proficiency	IFPX 283 Reading Comprehension and Proficiency	IFPX 293 Reading Comprehension and Proficiency
IFPX 277 Listening Comprehension and Oral Fluency	IFPX 287 Listening Comprehension and Oral Fluency	IFPX 297 Listening Comprehension and Oral Fluency

Tier 1 and 2: Students who achieve a grade of "C" or better in each course of the Tier will be permitted to advance to the next Tier.

Students who achieve a grade of "C-" or lower in one or more course will be required to repeat all courses of the Tier before advancing to the next Tier. Students are permitted to take courses twice. After two unsuccessful attempts to the student must retake the IFP Language Assessment with payment of the $250.00 CDN fee which will indicate appropriate tier placement for the student.

Tier 3: Students who achieve a grade of "C" or better in each of the required courses will have successfully completed the Tier. Students who achieve a grade of "C-" or lower in any Tier 3 course must repeat only the unsuccessful course(s). Students repeating courses will not have the original grade removed from the transcript of record. The transcript of record will indicate both the original grade and the repeated courses with the final grades in the term(s) in which they were taken.

Admission to a Degree/Diploma Program:

Upon the successful completion of Tier 2, students may apply to the IFP Bridging program to begin degree courses along with their Tier 3 courses or students can choose to apply for admission to a degree program at the University following the successful completion of Tier 3. Students must complete an Application for Admission to that program by the appropriate deadline (see A.4.1 Application for Admission in this Calendar).

Note: Completion of the IFP Preparation program does not guarantee admission to a degree or diploma program.

R.5 Admission to a Degree/Diploma Program

Upon the successful completion of Tier 2, students may apply to the IFP Bridging program to begin degree courses along with their Tier 3 courses or students can choose to apply for admission to a degree program at the University following the successful completion of Tier 3. Students must complete an Application for Admission to that program by the appropriate deadline (see A.4.1 Application for Admission in this Calendar).

Note: Completion of the IFP Preparation program does not guarantee admission to a degree or diploma program.

R.6 Degree Progression

A. IFP Pathways

Please refer to the Schulich School of Engineering section of the Calendar for detailed degree progression.

B. IFP Bridging

IFP Bridging students who successfully complete all Tier 3 courses with a grade of 'C' or better will meet the English Language Proficiency requirement for admission into most undergraduate programs*.

**Certain applicants must also present one of the following in order to satisfy the spoken English requirement:*

Nursing: Minimum score of 23 on the speaking component of the TOEFL iBT or 3+ on the MELAB Speaking Test

Education: Minimum score of 27 on speaking component of the TOEFL iBT or a 4- on the MELAB Speaking Test

C. IFP Preparation

IFP Preparation students who successfully complete all Tier 3 courses with a grade of 'C' or better will meet the English Language Proficiency requirement for admission into most undergraduate programs*.

*Certain applicants must also present one of the following in order to satisfy the spoken English requirement:

- Nursing: Minimum score of 23 on the speaking component of the TOEFL iBT or 3+ on the MELAB Speaking Test
- Education: Minimum score of 27 on speaking component of the TOEFL iBT or a 4- on the MELAB Speaking Test

Applicants to the Faculties of Law, Graduate Studies, Cumming School of Medicine (excluding applicants to the Bachelor of Health Sciences and Bachelor of Community Rehabilitation) or Veterinary Medicine should check English Language Proficiency requirements directly with those faculties.

R.7 Withdrawal from International Foundations Program Courses

The conditions of withdrawal from all IFP Pathways, Bridging and Preparation courses are outlined in section B.14 of the University Calendar and the individual faculty websites. Students will receive a 'W' designation on their University of Calgary transcript.

R.8 Faculty Information

IFP Pathways, Bridging and Preparation courses are listed in the Courses of Instruction section of this Calendar under International Foundations Program. For information on admission to any IFP stream, please contact the International Foundations Program office.

Location: Werklund School of Education, Education Tower 340

Telephone: 403.220.3277

Fax: 403.210.8554

Email: ifp@ucalgary.ca

Web: werklund.ucalgary.ca/ifp/

Faculty of Arts

1. Summary of Degree Programs

Degrees Offered

Degrees in the Humanities and the Social Sciences

Major Fields of Specialization	Undergraduate			Graduate
	Core	Enhancements	Other	
Ancient and Medieval History	BA[1]	Honours, Co-op	-	-
Anthropology, Social and Cultural	BA[1]	Honours, Co-op	-	MA, PhD
Anthropology	BSc[1]	Honours, Co-op	-	MA, PhD
Archaeology	BA[1], BSc[1]	Honours, Co-op	-	MA, PhD
Canadian Studies	BA[2]	Honours, Co-op	BA/BEd[5]	MA, PhD
Communication and Culture[8] **	BA, BSc	Co-op	BCC, BA/BEd[5]	-
Communications and Media Studies	BA[1,2]	Honours, Co-op	BCMS[4]	MA, MCS, PhD
Culture and Society	-	-	-	MA, PhD
Development Studies	BA[1,2]	Honours, Co-op	BA/BEd[5]	-
Earth Science	BSc[2]	Honours, Co-op	-	-
East Asian Language Studies	BA[1]	Co-op	-	-
East Asian Studies	BA[1,2]	Co-op	-	-
Economics	BA[1]	Honours, Co-op	-	MA, PhD
English	BA[1]	Honours, Co-op	BA/BEd[5]	MA, PhD
Film Studies	BA[1,2]	Honours, Co-op	BFS[7]	-
French	BA[1]	Honours, Co-op	BA/BEd[5]	MA
Geography	BA[1], BSc[1]	Honours, Co-op	BA/BEd[5], BSc/BEd[5]	MA, MSc, MGIS, PhD
German	BA[1]	Honours, Co-op	-	MA
Greek and Roman Studies	BA[1]	Honours, Co-op	-	MA
History	BA[1]	Honours, Co-op	BA/BEd[5]	MA, PhD
History and Philosophy of Science*	BA[1]	Honours, Co-op	-	MA
International Indigenous Studies	BA[1]	Co-op	-	-
International Relations	BA[1]	Co-op	BA/BEd[5]	-
Italian Studies	BA[1]	Co-op	-	-
Latin American Studies	BA[1,2]	Co-op	-	-
Law and Society	BA[1,2]	Honours, Co-op	-	-
Linguistics	BA[1]	Honours, Co-op	-	MA, PhD
Linguistics and Language	BA[1,2]	Co-op	-	-
Military and Strategic Studies	-	-	-	MSS, PhD
Philosophy	BA[1]	Honours, Co-op	-	MA, PhD
Political Science	BA[1]	Honours, Co-op	BA/BEd[5]	MA, PhD
Psychology	BA[1], BSc[1]	Honours	BA or BSc/BCR[6]	MSc, PhD
Religious Studies	BA[1]	Honours, Co-op	-	MA, PhD
Religious Studies and Applied Ethics*	BA[1]	Co-op	-	-
Russian	BA[1]	Honours, Co-op	-	-
Science, Technology and Society*	BA[2], BSc[2]	Honours, Co-op	-	-
Sociology	BA[1]	Honours, Co-op	BA/BEd[5]	MA, PhD
Spanish	BA[1]	Honours, Co-op	BA/BEd[5]	MA
Urban Studies	BA[1]	Co-op	-	-
Women's Studies	BA[1,2]	Honours, Co-op	-	-

**Program is currently suspended. No new admissions will be permitted.*
***The BSc in Communication and Culture is currently suspended. No new admissions will be permitted.*

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Degrees in the Fine Arts				
Major Fields of Specialization	Undergraduate Degrees			Graduate
	Core	Enhancements	Other	
Art - Art History*	BA[2]	-	-	-
Art - Visual Studies	BFA[4]	Honours, Co-op	BFA/BEd[5]	MFA
Dance	BA[2]	-	BA/BKin[9]	-
Drama	BFA[3]	-	-	MFA
Drama Education	-	-	BFA/BEd[5]	-
Music	BA[1,2]	Honours	-	-
Music - Composition	BMus[4]	-	-	MMus, PhD
Music - Integrated Studies	BMus[4]	-	-	-
Music - Music Education	-	-	BMus/BEd[5]	MMus
Music - Musicology	-	-	-	MA, PhD
Music - Music History and Theory	BMus[4]	-	-	-
Music - Performance	BMus[4]	-	-	MMus

The BA in Art History is currently suspended. No new admissions will be permitted.

1. Can be combined with: (a) an eligible BA, BSc, BFA or BMus within the Faculty of Arts, (b) an eligible BSc (Science) from the Faculty of Science, (c) a BSc (Engineering) from the Schulich School of Engineering, or (d) a BComm from the Haskayne School of Business.

2. Can be combined with: (a) an eligible BA, BSc, BFA or BMus within the Faculty of Arts, (b) an eligible BSc (Science) from the Faculty of Science, or (c) a BSc (Engineering) from the Schulich School of Engineering.

3. Can be combined with: (a) an eligible BA, BSc within the Faculty of Arts, (b) an eligible BSc (Science) from the Faculty of Science, or (c) a BSc (Engineering) from the Schulich School of Engineering.

4. Can be combined with an eligible BA or BSc within the Faculty of Arts.

5. Specialized Concurrent Degrees offered in conjunction with the Werklund School of Education.

6. Specialized Combined Degree offered in conjunction with the Cumming School of Medicine.

7. Degree programs that co-ordinate with related diploma programs at the Southern Alberta Institute of Technology and other similar institutions.

8. Multidisciplinary degrees without a Major Field of specialization.

9. Specialized Combined Degree offered in conjunction with the Faculty of Kinesiology.

Legend: Terminology and degree abbreviations are explained below.

Description of Undergraduate Degree Programs

The Faculty of Arts offers a wide spectrum of department-based, interdisciplinary and multidisciplinary undergraduate degree programs in the fine arts, the humanities and the social sciences. Except as otherwise noted below, details of the undergraduate programs summarized here are given in Sections 3 and 4 of this part of the Calendar.

Degree Programs within the Faculty of Arts:

Degree Programs with a Major Field of Study

The following degree programs normally require four years of study:

- Bachelor of Arts (BA), BA (Honours)
- Bachelor of Fine Arts (BFA), BFA (Honours)
- Bachelor of Music (BMus)
- Bachelor of Science (BSc), BSc (Honours)

Multidisciplinary Degree Programs

The following degree program normally requires three years of study:

- Bachelor of Communication and Culture (BCC) (Multidisciplinary)

The following degree programs normally require four years of study:

- BA or BSc (Multidisciplinary) in Communication and Culture

Multi-Institution Degrees

The following degree programs normally require two and one half years of study at the University of Calgary and two years of work on a related diploma at SAIT Polytechnic or a similar institution:

- Bachelor of Communication and Media Studies (BCMS)
- Bachelor of Film Studies (BFS)

Combined or Concurrent Degree Programs

The following two-degree programs normally require at least five years of study:

- BA, BFA or BSc (Arts)/BA, BFA or BSc (Arts) — within the Faculty of Arts
- BA (Arts) or BSc (Arts)/Bachelor of Commerce (BComm) — with the Haskayne School of Business
- BA (Arts) or BSc (Arts)/BSc (Engineering) — with the Schulich School of Engineering
- BA (Arts) or BSc (Arts)/BSc (Science) — with the Faculty of Science
- BA (Arts - see 3.4.5 for a list of eligible majors) or BFA (Drama Education or Visual Studies) or BMus (Music Education) or BSc (Geography)/Bachelor of Education (BEd) — with the Werklund School of Education
- BA (Dance)/BKin (Kinesiology) - with the Faculty of Kinesiology
- BA or BSc (Psychology)/Bachelor of Community Rehabilitation (BCR) (Medicine) — with the Cumming School of Medicine

Second Baccalaureate Degree Programs

Second BA, BSc, BA (Honours) or BSc (Honours) degrees with a Major Field are available following an appropriate first degree and normally take two additional years.

Co-operative Education

For many BA, BA (Honours), BSc and BSc (Honours) Degree Programs, relevant work experience can be integrated with academic study through Co-operative Education. Degree programs with Co-op normally take at least five years.

Arts and Science Honours Academy

The Arts and Science Honours Academy provides an enriched undergraduate experience for highly motivated students in the Faculties of Arts and Science. See the Program Details section below.

Double Majors

BA or BSc Degrees may be awarded with two Major Fields.

Minor Fields of Study

Students in degree programs in the Faculty of Arts are generally eligible to declare established minors from Continuing Education, Environmental Design, the Haskayne School of Business, the Cumming School of Medicine and Science as well as from Arts.

Minor Fields offered by the Faculty of Arts:

- African Studies
- Anthropology
- Applied Energy Economics
- Archaeology
- Canadian Studies
- Chinese
- Communication and Media Studies

- Dance
- Development Studies
- Drama
- Earth Science
- East Asian Studies
- Economics
- English
- French
- Film Studies
- Geography
- German
- Greek
- Greek and Roman Studies
- History
- History and Philosophy of Science
- Indigenous Studies
- Italian Studies
- Japanese
- Latin
- Latin American Studies
- Law and Society
- Linguistics
- Medieval, Renaissance and Reformation Studies
- Museum and Heritage Studies
- Music
- Philosophy
- Political Science
- Psychology
- Religious Studies
- Russian
- Science, Technology and Society
- Sociology
- Sonic Arts
- South Asian Studies
- Spanish
- Speech-Language Sciences
- Urban Studies
- Visual Studies and Art History
- Women's Studies

Graduate Programs

All graduate degree programs fall under the jurisdiction of the Faculty of Graduate Studies. In the Arts fields, the Faculty of Graduate Studies offers the following degrees:

- Master of Arts (MA)
- Master of Communication and Media Studies (MCS)
- Master of Fine Arts (MFA)
- Master of Geographic Information Systems (MGIS)
- Master of Music (MMus)
- Master of Strategic Studies (MSS)
- Master of Science (MSc)
- Doctor of Philosophy (PhD)

Details can be found in the Faculty of Graduate Studies Calendar.

2. Information for Undergraduate Students

Undergraduate student programs in the Faculty of Arts are governed by the regulations in this part and other relevant parts of the Calendar. The Associate Deans, Undergraduate Programs and Student Affairs co-ordinates program development for the Faculty as well as acting as trouble-shooter if students have academic concerns.

2.1 Advising and Program Information

For guidance on where to go for assistance, students may consult the Faculty of Arts website under arts.ucalgary.ca/undergraduate in addition to the following information.

Arts Students' Centre

The Faculty of Arts Students' Centre is the overall headquarters for undergraduate programs in the Faculty of Arts. The key objective of this office is to connect students with whatever academic assistance that they require.

In addition to housing the Associate Dean, Undergraduate Programs and Student Affairs and the Associate Dean for Teaching and Learning, the Arts Students' Centre is the specific home to:

- Program advising
- The Faculty's Co-operative Education Program
- The Arts and Science Honours Academy
- The Faculty's Interdisciplinary Programs
- A Student Help Desk

Location: Social Sciences Room 102

Phone: 403.220.3580

Email: ascarts@ucalgary.ca

Website: arts.ucalgary.ca/undergraduate/

Degree Advisors

Degree advisors in the Arts Students' Centre assist undergraduate students in planning their overall degree programs. For example, they provide advice for students on:

- Contextual (big-picture) questions about the Major Field and honours programs
- Graduation checks and confirmation
- Changes of Program
- Letters of Permission for study at other institutions
- Degree Navigator assistance
- After-degree program evaluation
- Honours applications and admissions
- New student registration

Location: Social Sciences Room 102

Phone: 403.220.3580

Email: ascarts@ucalgary.ca

Website: arts.ucalgary.ca/undergraduate/

Department Offices

Subject advisors in Department Offices deal with more specific inquiries related to courses and course content within a student's major. For example, these advisors assist students with:

- Course-related questions
- Details about the Major Field
- Details about honours programs
- Transfer-credit assessment
- Overloads
- Course time conflicts
- Credit by special assessment
- Course audits
- Initial grade appeals
- Prerequisite waivers

Note that the Faculty of Arts Students' Centre provides subject advising on the topics listed above for the interdisciplinary programs within the Faculty.

Contact information is provided for each Major and Minor program under 4. Program Details and a contact list is provided on the Faculty of Arts website: arts.ucalgary.ca.

Enrolment Services

Enrolment Services helps with registration issues and problems, fee payments, awards, financial aid, admissions questions, visiting and exchange students, open studies, transcripts, deferred exams, etc.

Location: MacKimmie Block (MB) Lobby

Phone: 1.403.210.7625

Website: ucalgary.ca/currentstudents/contact

Student Success Centre

The Student Success Centre (SSC) provides broad educational planning, learning support, assistance with academic difficulties, academic program guidance, writing support, success seminars, and peer support.

Location: Taylor Family Digital Library, 3rd Floor

Phone: 403.220.5881

Email: success@ucalgary.ca

Website: ucalgary.ca/ssc/

2.2 First-Year Options

Students are able to enter directly into the Faculty of Arts for first year. The following options are available to students:

1. Enter the Faculty of Arts and declare a degree program with a specific Major Field.

2. Enter the Faculty of Arts and declare a general or multidisciplinary degree program.

3. Enter the Faculty of Arts directly but do not declare a degree program immediately. (This is an interim measure prior to deciding on a degree program.)

Students intending to complete a degree program in the fine arts — i.e., programs in Art, Dance, Drama, or Music — should enter directly into their programs in first year so as to complete their undergraduate studies in a timely fashion. While most other degree programs in the Faculty of Arts can be completed in a four-year time frame if students declare their program or change into a new program by the end of their first year, students are advised to finalize a program as early as possible. Students must declare a program by the time they have completed 60 units (10.0 full-course equivalents) or

two years of study taking the normal course load. Admission to some programs is limited for transfer students as well as high-school applicants due to high demand and/or subject to additional selection criteria. See the Undergraduate Admissions section of this Calendar for details.

High-school applicants who are uncertain about their programs can choose either option 2 or 3. Subject to the constraints discussed above, there is considerable flexibility for subsequent program changes within the Faculty of Arts. Students may also be eligible to change to programs in other Faculties.

Students in the Faculty of Arts should be exposed to a range of academic disciplines throughout their program. Students in degree programs in Art History, Dance, Drama, Music and Visual Studies have prescribed first-year programs. All other Arts students, regardless of whether they have declared a Major, are encouraged to complete at least 15 units (2.5 full-course equivalents) from across the fields of study within the Faculty. Further guidance on first-year course selection is available from the University of Calgary Registration Guide.

3. Faculty Regulations

3.1 Admission

New applicants should refer to A.2 Undergraduate Admission in the Undergraduate Admissions section of this Calendar for regulations regarding University admission requirements.

Preparation

Prospective students wishing to enrol in any program of the Faculty of Arts need adequate preparation. High school matriculation or the equivalent is required and English Language Arts 30-1 as well as four other subjects, as specified in the Undergraduate Admissions section of this Calendar, must be included.

The following additional preparation items pertain to particular programs:

1. *Mathematics Preparation:* Students intending to major in Archaeology, Economics, Geography or Psychology should note that Alberta Education Pure Mathematics 30, Mathematics 30-1 (or the equivalent from other jurisdictions) is a prerequisite for some required courses and should be completed prior to admission.

2. *Additional Grade 12 Preparation:*

- For all Archaeology degrees with a concentration in Physical Anthropology, Biology 30 and Chemistry 30 are prerequisites for required courses.
- For all BSc degrees in Psychology, Biology 30 and Chemistry 30 are prerequisites for required courses. Physics 30 and Mathematics 31 are suggested as useful preparation.
- For the BSc in Anthropology and the BSc in Geography, Biology 30 and Chemistry 30 are strongly recommended as useful preparation because they are prerequisites for courses taken by most students.
- For all degrees in Economics, Mathematics 31 is suggested as useful preparation.

3. *Additional Application Requirements for Programs in the Fine Arts:*

- Applicants to the BFA (Visual Studies) program must submit a portfolio.
- Applicants to the BMus program must complete an online audition form (including background information and a statement of interest) and audition.
- Admission to the BMus, BA (Music) or Minor in Music programs requires evidence of successful completion of Grade II Royal Conservatory Theory/Advanced Rudiments or the departmental music theory diagnostic exam.
- Applicants to the BA (Dance) program must audition and submit a statement of interest.

Enrolment in the following majors may be limited: Communication and Media Studies, Dance, Drama, Economics, International Relations, Law and Society, Psychology, and Visual Studies. Whenever such limits are in effect, the admission average for a program will normally be higher than those for other programs in the Faculty of Arts.

Transfer Students

Students transferring from other faculties and institutions must meet the deadlines and competitive admission requirements in place for the program to which they are applying. For more information refer to A.2 Undergraduate Admission in the Undergraduate Admissions section of this Calendar.

Admission on Academic Probation

Students may be admitted or readmitted to the Faculty on probation if (a) they are on probation in another faculty at the time of admission to the Faculty of Arts, or (b) they previously have been required to withdraw from the University of Calgary or any other post-secondary institution (see 3.3.5 Readmission). Students admitted on probation must clear probation at their first academic review (see 3.3.4).

Second Baccalaureate Degree

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to programs leading to a Second Baccalaureate Degree with a Major Field or a Second Baccalaureate Degree program with Honours in a Major Field.

Students must apply to the Admissions Office and meet all deadlines and requirements. For more information on admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions. For more information regarding program requirements for a second degree, refer to 3.4.6 Second Baccalaureate Degrees.

3.2 Registration and Courses

3.2.1 Accuracy of Registration

Students are responsible for the completeness and accuracy of their registration and for arranging their course selections to meet all degree and program requirements as detailed in this Calendar. Any departure from standard degree and program requirements specified in this Calendar must receive prior written authorization by the Associate Dean, Undergraduate Programs and Student Affairs or other designate of the Dean.

Registration at all times should be appropriate to a student's current degree program unless a student receives explicit permission from the Associate Dean, Undergraduate Programs and Student Affairs. Students with inappropriate course selections may require extra courses and additional time to complete their degrees.

3.2.2 Registration Planning and Consultation

It is important for all students to check their records and registration regularly with the online Program-monitoring system, Degree Navigator, and meet with the Arts Degree Advisors and relevant Subject Advisors for guidance on any questions. Students should acquaint themselves with the dates and deadlines for registration set by the University (see B. Registration in the Academic Regulations section of this Calendar) and allow sufficient time before these deadlines to plan their registration and consult with advisors.

As students approach the completion of their programs, it is strongly recommended that students meet with an Arts Degree Advisor for a graduation check. Otherwise, a complete program audit is not done until a student applies for graduation when the consequences of any problems can be very serious.

3.2.3 Course Load

While five three-unit courses taken concurrently represent a normal full load, some programs prescribe additional courses. Students may elect to take up to six 3-unit courses in a term, but an extra course represents a substantial burden and may adversely affect overall performance.

In many programs, opportunities for accelerated progress also exist through credit courses in the Spring and Summer Intersession as well as credits obtained by Special Assessment.

3.2.4 Opportunities to Take Courses at Another Institution

Students may be authorized to take some course work at another university if registration as a visiting student is acceptable to that university. Students with poor academic performance, including those on probation or having a large number of withdrawals, will not be afforded this opportunity.

Students may apply online for such authorization by requesting a Letter of Permission through their online Student Centre. Students should check with program advisors

in the Arts Students' Centre to ensure that such transfer credits advance their particular programs. Once approved students will be advised officially as to how the proposed courses will transfer and an appropriate letter will be sent to the Registrar of the other university. The Letter of Permission must be obtained before the student registers for the courses at the other institution.

It will be the responsibility of the student to ensure that an official transcript of grades is forwarded directly to the Registrar of this university in order that appropriate credit may be officially recorded.

Many grade point average calculations used by the Faculty of Arts do not include transfer courses.

3.2.5 Credit in Courses by Special Assessment

The Faculty of Arts allows students to challenge some courses or, in other words, gain credit by special assessment. Students are referred to B.10.1 Credit in Courses by Special Assessment (Challenge Examinations) in the Academic Regulations section of this Calendar. Application for such credit should be made on the appropriate form and requires the approval of both the Department offering the course and the office of the Associate Dean, Undergraduate Programs and Student Affairs.

Not more than 30 units (5.0 full-course equivalents) completed by special assessment may be counted towards a degree.

3.2.6 Course Classification

Courses normally available for credit towards a baccalaureate degree carry numbers from 200 to 599. Courses numbered below 300 are termed junior courses; those numbered 300 or higher are senior courses.

The numbering of courses at the 200, 300, 400, and 500 levels in a particular field is intended to indicate the level of sophistication involved. Although some senior courses do not have prerequisites, it is very often the case that a 200-level course is a prerequisite for a 300-level course, a 300-level course is a prerequisite for a 400-level course, etc. The Faculty regularly publishes a list of senior courses that do not have prerequisites on its website.

Undergraduates may register in graduate courses at the 600 level only with the permission of the Department or Program offering the course.

3.2.7 First-Year Registration

Students may not register in courses at the 300 level or above until at least 18 units (3.0 full-course equivalents) at the 200 level have been successfully completed unless the 300-level course is a first-year program requirement or they receive permission of the Associate Dean, Undergraduate Programs and Student Affairs.

3.2.8 Prerequisites, Corequisites and Progression

All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of "C-".

Prerequisites are not normally waived. Minimum grades in prerequisite courses are required to ensure that students have the knowledge and skills necessary to succeed in more advanced courses. In exceptional cases, if students can demonstrate that they have equivalent knowledge to the prerequisites listed, they may seek consent from the Department offering the course to enrol in the course.

Students are responsible for ensuring that they have all of the prerequisites and corequisites for each course in which they register. While the online registration system is set up to help students avoid accidental registration in courses for which they lack prerequisites, situations arise where inappropriate course registrations can occur. If registration in any course is contrary to regulations, the Faculty may cancel such registration at any time before or during the term.

3.2.9 Writing Competence

Students who are identified as having deficient writing skills may be required to take steps to improve their writing.

3.2.10 Course Enrolment Limitations

Enrolment caps are in effect for many courses in the Faculty of Arts. Further, registration in some courses is initially limited to students in particular programs or stages of programs. Refer to the online Planning Guide for courses and dates.

3.2.11 Cross-Listed Courses

In the case of cross-listed courses within the Faculty of Arts, regardless of the title under which the course was taken, credit will be applied to a student's Major or Minor Field in the way that is most advantageous.

3.2.12 Withdrawal from Courses

Withdrawal from one or more courses or from all courses in a term can have serious consequences. Students are referred to B.14 Withdrawal from Courses and Withdrawal from the Term in the Academic Regulations section of this Calendar.

Before deciding to withdraw from courses, students are encouraged to seek advice from a program advisor in the Arts Students' Centre.

Students will normally be required to withdraw from the Faculty of Arts and the University if they have accumulated a total of more than 30 units (5.0 full-course equivalent) withdrawals while in attendance at the University of Calgary (see 3.3.3 Excessive Course Withdrawals).

3.2.13 Repetition of Courses

Strict limitations apply to the repetition of courses. See B.9 Repeating Courses in the Academic Regulations section of this Calendar.

3.2.14 Unauthorized Concentrations

Regardless of their home Faculties and degree programs, students are not permitted to include more than 36 units (6.0 full-course equivalents) from any group of courses constituting the Major Field of any program in the Faculty of Arts other than that to which a student has officially been admitted.

3.2.15 Declaration of a Major

Students have the option of entering the Faculty of Arts without declaring a Major. By the time 60 units (10.0 full-course equivalents) are completed, however, students must either declare a Major for which they are eligible or enter a (general) multidisciplinary program.

3.2.16 Duration of Study

The Faculty and Major-Field requirements that pertain to degrees awarded by the Faculty of Arts may change with every Calendar issue. The time of entry into a program in the Faculty of Arts is defined as the first session after admission to the program during which a student successfully completes any courses applicable to the program. A student's program is subject to the degree requirements that are in the Calendar current at the time of entry into the program. A student is allowed seven years counted from the time of entry into the program to graduate under these requirements.

Students who exceed this seven-year limit must consult with the Associate Dean, Undergraduate Programs and Student Affairs of the Faculty of Arts (or designate) who will decide on the degree requirements that will be applied for the proposed date of graduation.

3.3 Student Standing and Academic Review

3.3.1 Dean's List

The Dean's List, which is compiled annually at the end of the Winter Term, recognizes outstanding achievement by students in the Faculty. A statement of inclusion on the Dean's List will be recorded on the student's transcript.

To qualify for the Dean's List, a student must take a sufficient number of courses at the University of Calgary during the preceding Summer, Fall and Winter Terms and achieve a grade point average of 3.60 or above over all University of Calgary courses taken during that period. The alternative course load requirements are as follows:

(a) A minimum of 24 units (4.0 full-course equivalents) taken at the University of Calgary, OR

(b) A minimum of 24 units (4.0 full-course equivalents) taken at the University of Calgary plus successful completion of one four-month Co-operative Education work placement, OR

(c) A minimum of 12 units (2.0 full-course equivalents) taken at the University of Calgary plus successful completion of two four-month Co-operative Education work placements, OR

(d) A minimum of 12 units (2.0 full-course equivalents) taken at the University of Calgary plus successful completion of one or more approved full-time terms abroad, OR

(e) A program of study assessed by the Student Accessibility Services to be equivalent to (a), (b), (c) or (d) for a particular student.

Notes:

- Where it is appropriate for a student to be assessed under provisions (d) or (e), the student must arrange for all necessary documentation to be received by the Associate Dean, Undergraduate Programs and Student Affairs no later than May 15.
- Only University of Calgary grades for regular academic courses are used for the Dean's List; grades earned for Co-operative Education work placements or study-abroad terms do not enter into the grade point average calculations for (b), (c) or (d).
- Students on academic sanction are not eligible for the Dean's List.
- Students with deferred examinations and/or term work after Winter Term may not be eligible to be included on the Dean's List.

3.3.2 Performance Review, Probationary Status and Dismissal

Students are referred to section F.7 on Unsatisfactory Standing in the Academic Regulations section of this Calendar.

The academic standing of students registered in the Faculty will be reviewed after each Winter Term provided that they have completed at least 18 units (3.0 full-course equivalents at the University of Calgary since their previous review. (Students who have not completed 18 units (3.0 full-course equivalents since the previous review will retain their existing status until the next subsequent review.) All University of Calgary credit courses, which have been completed since the previous review, are used for the purpose of academic review. Students placed on academic probation or required to withdraw as a result of the academic performance review will be so advised in writing.

Notwithstanding the specific regulations pertaining to Student Standing, students' academic standing may be reviewed at any time and those with generally poor academic records may be placed or continued on academic probation or required to withdraw at the discretion of the Associate Dean, Undergraduate Programs and Student Affairs or other delegate of the Dean.

Students in Satisfactory Standing

(a) Will retain that standing if they have achieved a GPA of at least 2.00 over all courses taken since the previous review.

(b) Will be placed on academic probation if they have achieved a GPA of at least 1.70 but less than 2.00 over all courses taken since their previous review and have not been on academic probation within the preceding five years.

(c) Will be required to withdraw from the Faculty if they have achieved a GPA less than 2.00 over all courses taken since their previous review and they have a probationary period within the last five years. (Probationary periods that have occurred in excess of five years previous will not be counted).

(d) Will be required to withdraw from the Faculty if they have achieved a GPA of less than 1.70 over all courses taken since their previous review.

Academic Turnaround Program (ATP)

The Academic Turnaround Program (ATP) provides eligible students facing their first Required to Withdraw (RTW) ruling for academic reasons the opportunity to continue in their current program or to seek admission to the Faculty of Arts following a RTW ruling from their current faculty. Students in the Faculty of Arts will receive a written invitation to participate in the Academic Turnaround Program from the dean or designate. Students accepted to the ATP may continue their studies under Special Academic Probation provided that they fulfill all requirements and are compliant with the conditions of the program. All ATP requirements will be provided to students in writing by the faculty dean or designate. Students who do not fulfill all requirements or who fail to meet the GPA criteria outlined below will be required to withdraw from the University and will be notified by the dean or designate.

At the end of the following Winter Term, students' progress will be reviewed by the Faculty regardless of the number of courses completed. In order to continue on Special Academic Probation, students must receive a cumulative GPA of 2.00 across all courses taken in the previous Summer (including Spring Intersession), Fall and Winter Terms. Students who have completed 18 units (6 half courses) and received a cumulative GPA of 2.00 across all courses taken will have completed Special Academic Probation and are considered in good academic standing.

Students who are non-compliant with any of the ATP conditions will be required to withdraw. Students may only participate once in the ATP.

Students on Probation

(a) Will be reinstated in satisfactory standing if they have achieved a GPA of at least 2.00 over all courses taken since their previous review;

(b) Will be required to withdraw from the Faculty if they have achieved a GPA of less than 2.00 over all courses taken since their previous review.

3.3.3 Excessive Course Withdrawals

At the time of the Academic Review after winter term, students who have withdrawn from more than 30 units (5.0 full-course equivalents) will be required to withdraw from the Faculty of Arts unless they can demonstrate sufficient cause for their course withdrawals.

3.3.4 Mitigating Circumstances

Students who would normally be required to withdraw on the basis of their academic performance or excessive withdrawals may be placed on academic probation instead if they have experienced serious mitigating circumstances and can demonstrate that they have good prospects for future success. Students who believe that they fall into this category should discuss their situations with the Arts Students' Centre at the earliest possible opportunity and no later than the end of Winter Term.

3.3.5 Readmission

Students who have been required to withdraw from the Faculty of Arts, other Faculties at the University of Calgary or other post-secondary institutions due to unsatisfactory academic performance or excessive course withdrawals may be considered for (re)admission after 12 or more months have elapsed since the date of dismissal.

(Re)admission is not guaranteed. Applicants must apply by the deadlines stated in the current Calendar and meet the current admission requirements of the program to which they are seeking admission.

Readmission After Deficient Academic Performance

Students who have been required to withdraw due to deficient academic performance should note that it is not normally possible to be readmitted to the Faculty of Arts without first taking courses to improve their grade point averages to meet the required admission averages for their programs.

Students (re)admitted after having been required to withdraw from the Faculty of Arts due to unsatisfactory academic performance must maintain a grade point average of at least 2.00 on all courses taken in each academic review period after readmission. Failure to do so will result in permanent dismissal from the Faculty of Arts.

Readmission After Excessive Course Withdrawals

Students (re)admitted after having been required to withdraw from the Faculty of Arts due to excessive withdrawals from courses must obtain Faculty permission to withdraw from any further courses. Failure to do so will result in permanent dismissal from the Faculty of Arts.

Limitation on Readmission

Students who have twice been required to withdraw from any Faculties at the University of Calgary and/or any other post-secondary institution will not normally be considered for admission to the Faculty of Arts at any time.

3.4 Graduation

3.4.1 Degrees with a Major Field

Faculty of Arts Requirements for Degrees with a Major Field

The following requirements apply to all Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music and Bachelor of Science degrees with a Major Field:

1. Overall Program: Successful completion of an approved program consisting of 120 units (20.0 full-course equivalents).

2. Program Focus: Successful completion of the "Major-Field Requirements" and any associated "Other Requirements" for the relevant degree.

3. Academic Achievement:

(a) A minimum GPA of 2.00 must be achieved over all courses in the Major Field and over all courses in the program.

(b) A maximum of 6 units (1.0 full-course equivalent) "D" or "D+" grade in the Major Field and a maximum of 18 units (3.0 full-course equivalent) "D" or "D+" grades overall.

4. University of Calgary Study:

(a) A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

(b) A maximum of 24 units (4.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the major field.

5. Depth: A maximum of 48 units (8.0 full-course equivalents) at the junior or 200 level.

6. Breadth: All students, except those in the BMus Degree, must take a minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science.

7. Physical Activity Courses: A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory, and Physical Education Activity/Theory.

Note: For each degree program, the "Major-Field Requirements" and any associated "Other Requirements" are defined under 4. Program Details. For each BA and BSc degree with a Major Field (and for the BCMS and BFS) at least 42 units (7.0 and not more than 8.0 full-course equivalents) in the Major Field are normally required. Students can choose to include additional courses in the Major Field to a maximum of 60 units (10.0 full-course equivalents). The Major Fields in BFA and BMus degrees typically require considerably more courses. The completion of some programs requires additional supporting courses from outside the Major Field.

Degrees with a Double Major

Students desiring a degree with a double Major must complete all of the Faculty, Major-Field and Other Requirements pertaining to both Majors. Permission to undertake a double major must be obtained from the Faculty of Arts.

Some restrictions apply to the pairing of majors as discussed under 4. Program Details. Note that to complete some double Majors, more than 120 units (20.0 full-course equivalents) may be needed.

Major Fields "With Distinction"

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of any students completing a Major with a grade point average of at least 3.60 over the last 90 units (15.0 full-course equivalents) taken for the degree. Courses from other institutions as well as the University of Calgary can be used in this calculation. In cases in which the last 90 units (15.0 full-course equivalents) must include some but not all of a group of courses taken concurrently, the selection will be made in the manner most advantageous to the student.

3.4.2 Honours Degrees with a Major Field

Honours degrees provide students with an opportunity to pursue greater depth in a field of study. An important objective is to prepare the student for possible entry to graduate-level degree programs. High standards of performance are required.

Application Process and Deadline

While the point of their studies at which students are eligible to enter Honours varies considerably across programs, students are advised to apply for Honours as early as their programs permit. Delay may result in additional time to complete prerequisite courses and/or additional coursework beyond the normal 120 units (20.0 full-course equivalents).

Application deadlines fall between January 23 and May 1 annually, depending on the program. Consequently, interested students should consult with the Subject Advisor or Honours Co-ordinator for their program well in advance of January 23.

As part of an application to Honours, some programs require the submission of a research proposal, confirmation of supervisory and/or laboratory arrangements, etc. Students must submit all required materials to the Subject Advisor for their program and confirm their requests for Honours using the Change of Program option in the online Student Centre by the deadline. Using the Student Centre alone is generally not sufficient.

Notes:

- Programs may elect to consider late applications if they can accommodate additional students.
- It is generally an advantage to complete application items such as a research proposals, confirmation of supervisory and/or laboratory arrangements, etc. as early as possible, especially where space in an Honours program is limited.

Admission

Admission to Honours is based on three criteria:

1. *Completed Courses:* For each Honours program, a minimum number of courses must be successfully completed by the end of the Winter Term in the year that a student applies. This minimum number of courses for each program, which is reported in the 4. Program Details section, is between 30 and 75 units (5.0 and 12.5 full-course equivalents). Students may also be required to have taken a minimum number of courses, or particular courses, in the Major Field.

2. *Academic Performance:* For each Honours program, a minimum grade point average must be attained on all courses subject to assessment and on all courses in the major among those subject to assessment. The minimum grade point average for each Program will be at least 3.30 and may be higher in Programs where student demand exceeds the program capacity. If between 30 and 60 units (5.0 and 10.0 full-course equivalents) have been taken, then all courses are subject to assessment whereas if more than 60 units (10.0 full-course equivalents) have been taken, then only the most recent 60 units (10.0 full-course equivalents) are subject to assessment.

3. *Program Consent:* While Programs in the Faculty of Arts are committed to encouraging high-achieving students, the enrolment capacity of some Honours Programs may be limited by the availability of undergraduate thesis supervisors, laboratory spaces, etc. To obtain consent of a Program, students must also satisfactorily complete any application procedures set out in the 4. Program Details section. These procedures may include the submission of a research proposal, confirmation of supervisory and/or laboratory arrangements, etc.

Notes:

- Courses from other institutions as well as the University of Calgary can be used in a student's grade-point calculation.
- Programs will announce annually by October 1 on their websites if their qualifying averages for Honours will be set above 3.30 for the following academic year.

Performance Review

The academic standing of each Honours student will be reviewed each year following the Winter Term. Continuation in an Honours program is contingent upon students achieving a GPA of at least 3.30 over all courses completed and all courses completed in the major since the last review.

Faculty of Arts Requirements for Honours Degrees

The following requirements apply to all Bachelor of Arts Honours, Bachelor of Fine Arts Honours and Bachelor of Science Honours Degrees with a Major Field:

1. Overall Program: Successful completion of an approved program consisting of 120 units (20.0 full-courses equivalents).

2. Program Focus: Successful completion of the "Major Field with Honours Requirements" and any associated "Other Requirements" for the relevant degree.

3. Academic Achievement:

(a) Over the final 90 units (15.0 full-course equivalents), a minimum GPA of 3.30 must be achieved on all courses and on all courses in the Major Field.

(b) A maximum of 6 units (1.0 full-course equivalent) "D" or "D+" grade in the Major Field and a maximum of 18 units (3.0 full-course equivalent) "D" or "D+" grades overall.

4. University of Calgary Study:

(a) A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

(b) A maximum of 24 units (4.0 full-course equivalents) in eligible post-secondary

transfer credits from other institutions may be counted toward the Major Field.

5. Depth: A maximum of 48 units (8.0 full-course equivalents) at the junior or 200 level.

6. Breadth: All students, except those in the BMus Degree, must take a minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science. *7. Physical Activity Courses:* A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory, and Physical Education Activity/Theory.

Note: For each degree program, the "Major-Field with Honours Requirements" and any associated "Other Requirements" are defined under 4. Program Details. For each BA, BFA or BSc Honours degree at least 54 units (9.0 and not more than 10.0 full-course equivalents) in the Major Field are normally required. Students can choose to include additional courses in the Major Field to a maximum of 72 units (12.0 full-course equivalents). The completion of some programs requires additional supporting courses from outside the Major Field.

First Class Honours

The notation "First-Class Honours" will be inscribed on the permanent record and graduation parchment of any students completing an Honours Program with a grade point average of at least 3.60 over the last 90 units (15.0 full-course equivalents) taken for the degree. Courses from other institutions as well as the University of Calgary can be used in this calculation. In cases in which the last fifteen must include some but not all of a group of courses taken concurrently, the selection will be made in the manner most advantageous to the student.

3.4.3 Minor Fields

Students may formally declare a Minor and have this officially recorded on their transcript of record. To obtain a Minor, students must complete at least 30 units (5.0 full-course equivalents) from the Minor Field and any requirements specified for the particular Minor. Students are normally not permitted to count more than 36 units (6.0 full-course equivalents) from their Minor fields in their degrees. See the sub-section on 3.2.14 Unauthorized Concentrations.

Students in the Faculty of Arts may be eligible to declare Minor Fields from Continuing Education, the Haskayne School of Business, the Faculty of Medicine and the Faculty of Science as well as the Faculty of Arts. Students should consult the Calendar regulations for the Faculties within which they intend to declare a Minor. For Minors from the Faculty of Arts, see the section on 4. Program Details.

At least one Minor Field of study must be formally declared in conjunction with the Multidisciplinary Degree Programs. Some restrictions apply to the pairing of majors and minors as discussed under 4. Program Details. Students are advised that course work in addition to the normal 120 units (20.0 full-course equivalents) may sometimes be required if a formal Minor program is declared.

The declaration of a Minor must be made not later than the time of last registration. To receive further information, contact an Arts Degree Advisor in the Arts Students' Centre.

Note: In accordance with other parts of this Calendar, students pursuing degrees from other Faculties may or may not be eligible to declare Minors from the Faculty of Arts at the discretion of their home Faculty.

3.4.4 Co-operative Education Programs

Introduction

In the Faculty of Arts, most degree programs, including honours degree programs, are offered with a Co-operative Education (Co-op) option. Co-op Programs normally take five years to complete and include 12 to 16 months of paid supervised work experience in various private companies, government agencies and non-profit organizations. After second year, three or four work terms are interspersed with regular academic terms. Co-operative Education Programs provide students with opportunities to experience the linkages between academic knowledge and a variety of appropriate job situations. Students completing the requirements of the Co-operative Education option will graduate with "Co-operative Education" designated on their transcripts and degree parchments.

Students who are interested in pursuing the Co-operative Education option are urged to discuss their plans and course selection with the Co-operative Education Co-ordinators in the Faculty of Arts Co-operative Education Office as early in their program as possible.

Faculty of Arts Co-operative Education Office

Location: Social Sciences 102, Arts Students' Centre

Phone: 403.210.8509 or 403.220.8636

Email address: artscoop@ucalgary.ca

Website: arts.ucalgary.ca/co-op/

Students should also consult with the subject advisor in the relevant Department or Program, particularly if they are considering combining Honours and Co-operative Education programs. In addition, students are referred to the Co-operative Education/ Internship section of this Calendar.

Notes:

- The Bachelor of Communication and Media Studies and the Bachelor of Film Studies may be taken with Co-op but students may face sequencing constraints and/or require extra time to complete their programs.
- Co-operative Education is not available in conjunction with BA, BFA and BSc Degrees with the following Major Fields: Art History, Dance, Drama, Music, and Psychology. It is also not available to the BMus degree program.
- Developing and implementing job-search skills is a part of the Co-operative Education Program. The Program does not guarantee that students will obtain work term placements.

Admission

Students must submit a completed application to the Faculty of Arts Co-operative Education program at arts.ucalgary.ca/co-op/home/apply-co-op by the deadline of October 15. The minimum eligibility criteria are as follows:

1. Students must meet all of the Requirements specified in the Co-operative Education/Internship section of this Calendar.

2. Students must have completed at least 30 units by October 15 (excluding the courses they are currently registered in), they must be engaged in full-time study, and they must have achieved a grade point average of 2.50 over their most recent 30 units (5.0 full-course equivalents).

3. A minimum of 30 units (5.0 full-course equivalents) must be remaining in their degree after their first planned work term, including a plan to end on an academic semester.

Meeting the minimum eligibility requirements does not guarantee admission. Capacity in the program may be limited due to program resources and market conditions.

Progress Through the Program

Progress through the Co-operative Education Program is bound by the rules concerning Registration, Course Work, Student Standing, Fees and Expenses and Withdrawal Policies specified in the Co-operative Education/Internship section of this Calendar.

Sequence

Those students who successfully apply by October 15 normally undergo preparation in the Term they applied and search for placement during the following Winter Term and enter their first work term in Spring/Summer term or the following Fall Term. Subsequent work terms are interspersed with academic terms. A minimum of three work terms is required and a fourth may be approved at a student's request. Students must complete all of the academic requirements for their programs and must finish on a full-time academic term.

Development of Job-Search Skills

Approval for a student's first work term and registration in the accompanying course, Co-operative Education 511.01, is conditional on full participation in the pre-placement preparatory activities established by the Co-operative Education Office.

Prescribed Preparatory Courses

To provide a sound foundation for work terms related to a Major Field of study and to enhance the student's ability to compete for opportunities, academic Departments and Programs may also recommend courses to be completed by students in that Major. A list of the recommended courses for each Major Field is available through the Co-operative Education office. These courses would be based on available courses in first and second year.

Work Term Activity

Students are expected to focus on their placements and do not normally take any academic courses during their work terms. Nevertheless, students may elect to take one three-unit course during a second and/or subsequent work term provided that they have a strong academic and placement records and the course does not occur during work hours or interfere with work term responsibilities.

Work Term Assessment

The mandatory work term courses, Co-operative Education 511.01, 511.02 and 511.03, and the additional course, Co-operative Education 511.04, are graded on a credit (CR) or fail (F) basis. A positive assessment requires satisfactory performance on each of the following items:

(a) The Co-operative Education Co-ordinators evaluation of job performance, which is based on an on-site visit where practical.

(b) The employer's evaluation of job performance.

(c) The student's self-assessment of job performance and the overall job experience, which is normally based on participation in a debriefing or integrative session.

(d) A work term report prepared by the student and evaluated by the Faculty.

Note: Upon the request of a student, the Faculty may approve registration in Co-operative Education 511.04 in conjunction with an extra (fourth) work term.

Completion

To graduate with the Co-operative Education designation, students must:

(a) Successfully complete all of Co-operative Education 511.01, 511.02, 511.03.

(b) Successfully complete Co-operative Education 511.04 if permission has been received to register in this course.

(c) Achieve a minimum grade point average of 2.50 over their final 90 units (15.0 full-course equivalents) of academic subjects.

Note: Students must also meet all of the regular academic requirements for graduation in their BA or BSc degree programs.

3.4.5 Combined Degrees

Combined Degrees programs lead to two degrees and normally take at least five years to complete. It is often possible to earn one or both of the Degrees with Honours.

Combined Degree programs require careful selection of courses to complete all requirements of the two Major Fields. For advising on Faculty of Arts component(s) of Combined Degrees, students should consult with both the program advisor in the Arts Students' Centre and the relevant Subject Advisor(s).

If courses have been chosen carefully, it may be possible for students to opt out of a combined degree program after the end of their third year and still complete a single degree program in four years. If courses have been unevenly distributed, however, it may require more than four years to complete a single degree.

Note: As described in Section 3.4.1, a single degree with Double Major (i.e., two majors) requires at least 120 units (20.0 full-course equivalents). By contrast, a combined degree program yields two degrees and requires at least 150 units (25.0 full-course equivalents).

Faculty of Arts Requirements for Combined Degrees

The following faculty requirements apply to Combined Degrees programs that include a BA, BFA, BMus or BSc with a Major Field from the Faculty of Arts.

1. *Overall Program:* Successful completion of an overall program consisting of at least 150 units (25.0 full-courses equivalents).

2. *Program Focus:* Successful completion of the Major Field Requirements and any associated "Other Requirements" for any/each BA, BFA, BMus or BSc from the Faculty of Arts.

3. *Academic Achievement:*

(a) A minimum GPA of 2.00 must be achieved over all courses in the Major Field and over all courses in the program.

(b) A maximum of 6 units (1.0 full-course equivalent) "D" or "D+" grade in the Major Field and a maximum of 18 units (3.0 full-course equivalent) "D" or "D+" grades overall.

4. *University of Calgary Study:*

(a) A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

(b) A maximum of 24 units (4.0 full-course equivalents) in eligible post-secondary s from other institutions may be counted toward the Major Field.

5. *Depth:* A maximum of 54 units (9.0 full-course equivalents) at the junior or 200 level.

6. *Breadth:* A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science. (Students in the BA (Dance), BFA and BMus Degrees are exempt from this requirement only if the second degree is outside the Faculty of Arts).

7. *Physical Activity Courses:* A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

Notes:

- For each degree program, the "Major-Field Requirements" and any associated "Other Requirements" are defined below under 4. Program Details.
- The Faculty and Program Requirements of the partner Faculty must also be met.

Faculty of Arts Requirements for Combined Degrees with an Honours Component

The following faculty requirements apply to Combined Degrees programs that include an BA Honours or BSc Honours from the Faculty of Arts.

1. *Overall Program:* Successful completion of an overall program consisting of at least 150 units (25.0 full-courses equivalents).

2. *Program Focus:* Successful completion of the Major Field with Honours Requirements and any associated "Other Requirements" for any/each BA or BSc Honours from the Faculty of Arts.

3. *Academic Achievement:*

(a) A minimum GPA of 3.30 must be achieved over the final 90 units (15.0 full-course equivalents).

(b) A maximum of 6 units (1.0 full-course equivalent) "D" or "D+" grade in the Major Field and a maximum of 18 units (3.0 full-course equivalents) "D" or "D+" grades overall.

4. *University of Calgary Study:*

(a) A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

(b) A maximum of 24 units (4.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the Major Field.

5. *Depth:* A maximum of 54 units (9.0 full-course equivalents) at the junior or 200 level.

6. *Breadth:* A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science. (Students in the BA (Dance), BFA and BMus Degrees are exempt from this requirement only if the second degree is outside the Faculty of Arts).

7. *Physical Activity Courses:* A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

Notes:

- For each degree program, the "Major-Field with Honours Requirements" and any associated "Other Requirements" are defined below under 4. Program Details.
- The Faculty and Program Requirements of the partner Faculty must also be met.

Combined Degree Programs within the Faculty of Arts

BA, BFA, BMus or BSc (Arts)/BA or BSc (Arts)

This program leads to two degrees from the Faculty of Arts. One or both degrees may be awarded with Honours.

Students may either be admitted to both degree programs when they first apply to the University or may seek admission to a second Degree Program after being admitted. Students must satisfy the requirements for admission to the Faculty of Arts and each program therein. (See the Undergraduate Admissions section of this Calendar).

Students applying for Honours must follow the Admission procedures specified for Honours Degrees with a Major Field and, once admitted, they are subject to the annual Performance Review for Honours.

In addition to the Faculty of Arts Requirements for Combined Degrees and/or Combined Degrees with an Honours Component listed above, students must adhere to the program requirements for each Major Field and/or each Major Field with Honours as described in 4. Program Details section.

Specialized Combined Degree Program with the Faculty of Kinesiology

Dance can be combined with Kinesiology:

- Bachelor of Arts (Dance)/Bachelor of Kinesiology (Kinesiology) - see School of Creative and Performing Arts under 4. Program Details

Specialized Combined Degree Program with the Cumming School of Medicine

Psychology can be combined with Community Rehabilitation and Disability Studies:

- Bachelor of Arts (Psychology) or Bachelor of Science (Psychology)/Bachelor of Community Rehabilitation (Medicine) — see Psychology under 4. Program Details.

Specialized Concurrent Degree Programs with the Werklund School of Education

In several specialized fields in the Faculty of Arts, Concurrent Degree programs are offered in conjunction with the Werklund School of Education:

- Bachelor of Arts (Canadian Studies)/ Bachelor of Education
- Bachelor of Arts (Communication and Culture (Multidisciplinary Studies))/Bachelor of Education
- Bachelor of Arts (Development Studies)/ Bachelor of Education
- Bachelor of Arts (English)/Bachelor of Education
- Bachelor of Fine Arts (Drama Education)/ Bachelor of Education
- Bachelor of Arts (French)/Bachelor of Education
- Bachelor of Arts or Bachelor of Science (Geography)/Bachelor of Education
- Bachelor of Arts (History)/Bachelor of Education
- Bachelor of Arts (International Relations)/ Bachelor of Education
- Bachelor of Arts (Music)/Bachelor of Education (elementary route only)
- Bachelor of Music (Music Education)/ Bachelor of Education (secondary route only)
- Bachelor of Arts (Political Science)/Bachelor of Education
- Bachelor of Arts (Sociology)/Bachelor of Education
- Bachelor of Arts (Spanish)/Bachelor of Education
- Bachelor of Fine Arts (Visual Studies)/ Bachelor of Education

For more information on the requirements of the Arts major, see 4. Program Details. For the Education requirements see the Werklund School of Education.

Combined Degree Programs With Other Faculties

Bachelor of Arts and Bachelor of Science programs in the Faculty of Arts can be taken in combination with approved undergraduate programs from other Faculties. More than 150 units (25.0 full-course equivalents) may be required to complete some degree combinations. The Faculty of Arts degree may often be awarded with Honours, but more than 150 units (25.0 full-course equivalents) will frequently be needed for completion.

Students may either be admitted to both degree programs when they first apply to the University or may seek admission to a second Degree Program after being admitted. Students must satisfy the requirements for admission to both Faculties and Programs. (See the Undergraduate Admissions section of this Calendar.) Applicants for Honours must follow the Admission procedures specified for Honours Degrees with a Major Field.

The Graduation requirements of both Faculties and Programs must be met. On the Arts side, students must meet the Faculty of Arts Requirements for Combined Degrees or Combined Degrees with an Honours Component listed above as well as the program-specific requirements for the Major Field or Major Field with Honours as described in the 4. Program Details section.

While other Combined Degrees may be approved with the consent of both Faculties, students may apply directly for the three well-established Combined Degree Programs listed below:

Combined BComm/BA (Arts) or BSc (Arts)

This combined program leads to a Bachelor of Commerce from the Haskayne School of Business and either a Bachelor of Arts or a Bachelor of Science from the Faculty of Arts. The Haskayne School of Business provides complementary information on Combined Degrees in their section of this Calendar. The Haskayne School of Business limits combined degrees to specified majors within the Faculty of Arts.

Combined BSc (Engineering)/BA (Arts) or BSc (Arts)*

This combined program leads to a Bachelor of Science in Engineering from the Schulich School of Engineering and either a Bachelor of Arts or a Bachelor of Science from the Faculty of Arts. The Schulich School of Engineering provides complementary information on Combined Programs in their section of this Calendar.

Note: Because engineering degrees are highly structured, more than 150 units (25.0 full-course equivalents) are typically required. Further, students who opt out of this Combined Degree program, particularly if they do so after first year, often require more than four years to complete a single degree.

Combined BSc (Science)/BA (Arts) or BSc (Arts)*

This combined program leads to a Bachelor of Science from the Faculty of Science and either a Bachelor of Arts or a Bachelor of Science from the Faculty of Arts. The Faculty of Science provides complementary information on Second Degree Programs in their section of this Calendar.

**The BA (Dance) and the BFA (Drama) may also be used in these combinations, but scheduling constraints may pose difficulties and more than 150 units (25.0 full-course equivalents) are likely to be required to complete both sets of degree requirements. The BFA (Visual Studies) and the BMus degrees can only be used in these combinations with special permission from both Faculties.*

3.4.6 Second Baccalaureate Degrees

Students will not normally be admitted to a Second Degree program in any field in which they already possess a degree. Some further restrictions apply to the pairing of majors in the first and second degree as discussed in the 4. Program Details section.

Upon admission to their program, students are advised to contact the Arts Students' Centre to discuss their academic plans, obtain general advice and receive an assessment of the remaining requirements.

Modified Rules and Regulations

The rules and regulations pertaining to 3.4.1 Degrees with a Major Field and 3.4.2 Honours Degree's with a Major Field remain applicable with the following modifications:

(a) Up to 60 units (10.0 full-course equivalents) counted towards any previous degrees may be used towards requirements in the Second Degree. These may not include more than 24 units (4.0 full-course equivalents) toward the new Major Field.

(b) Courses extra to previous degrees and so noted on transcripts may be counted towards the Second Degree if completed before enrolling in the Second Degree program and if consistent with Faculty regulations.

(c) Of all courses used toward the second degree, at least 60 units (10.0 full-course equivalents) must be taken from the University of Calgary.

(d) The Second Degree will be awarded "With Distinction" or “First-Class Honours” as applicable if a GPA of at least 3.60 is achieved over the courses completed for the Second Degree excluding the previous credit allowed under (a) above.

(e) For a second BA with Honours, admission to Honours will be determined based on the overall grade point average obtained for the final 60 units (10.0 full-course equivalents) in the first degree while the grade point averages required for graduation with Honours will be calculated using the courses completed for the Second Degree.

Co-operative Education

For Major Fields of specialization in which the Faculty of Arts offers Co-operative Education Programs, students may apply for

a Second Degree or a Second Degree with Honours that includes Co-operative Education. Application for admission to the Co-operative Education program must be made when the student applies for admission to the Second Degree. Students who would have more than 84 units (14.0 full-course equivalents) completed towards the Second Degree prior to their first Co-operative Education placement are normally not eligible.

Students in Second Degree programs with Co-operative Education are subject to:

(a) All of the requirements pertaining to Second Degrees with a Major Field or Second Degrees with Honours in a Major Field, and

(b) All of the requirements specified for Co-operative Education Programs.

4. Program Details

4.1 Arts and Science Honours Academy

Introduction

The Arts and Science Honours Academy (ASHA) provides an enriched structure for the undergraduate experience in Arts and Science. It is a program for motivated students of demonstrated ability who aspire to a well-rounded education that combines the depth of an Honours degree or the equivalent with the breadth of dedicated interdisciplinary courses, a language requirement and an international experience.

Program Director: M. Ullyot

Admission

Entrance to the Program is competitive. Criteria include high academic achievement (a minimum high school average of 85 per cent) and evidence of community or academic involvement and leadership. Students must complete a separate online ASHA admission form, which will include a brief writing piece. Students may be interviewed (in person or by phone) as part of the application process. While admission is normally limited to incoming first year students, the participating Faculties may each nominate up to two students for consideration for admission after the first year.

Requirements

1. *Academic Achievement:* Excellence in a degree program from the Faculty of Arts or the Faculty of Science demonstrated by either:

(a) Successful completion of a BA or BSc with Honours, or

(b) Completion with distinction of a BA or BSc with a Major Field and a significant independent research course.

2. *Second Language:* At least 6 units (1.0 full-course equivalent) in a (single) language other than English. The language requirement may be fulfilled during the international experience.

3. *International Experience:* While students are strongly encouraged to go abroad for a full academic year, they must participate in an approved study abroad or work abroad program of a duration of a minimum of 12 consecutive weeks. In exceptional cases, other arrangements may be considered. Students must submit a travel proposal appropriate for their program to the program director at the end of their second year.

4. *Arts and Science Honours Academy Core Courses:* 18 units (3.0 full-course equivalents) taken through the ASHA program as follows:

(a) Arts and Science Honours Academy 220 Quests and Questions (6 units or 1.0 full-course equivalent)

(b) Arts and Science Honours Academy 321 Problems in Representation (3 units or 0.5 full-course equivalent)

(c) Arts and Science Honours Academy 421 Invention (3 units or 0.5 full-course equivalent)

(d) Arts and Science Honours Academy 501 The Nature of Research (3 units or 0.5 full-course equivalent)

(e) Arts and Science Honours Academy 503 Capstone Seminar (3 units or 0.5 full-course equivalent)

Note: These courses may be used to satisfy the breadth requirements of courses outside the Home Faculty.

Other Requirements

Continuation in the program

Year 2: In order to continue into Year Two in good standing, students must have completed Arts and Science Honours Academy 220 and must have completed at least 24 units (4.0 full-course equivalents) with a minimum GPA of 3.30. Students whose GPA is between 2.70 and 3.30 will be placed on probation for one year. One period of probation will be permitted during the program. Probation will be cleared if the GPA at the next annual review is 3.30 or greater.

Year 3: In order to continue into Year Three in good standing, students must have completed at least 24 units (4.0 full-course equivalents) in Year Two, including Arts and Science Honours Academy 321 and 421, must have maintained a GPA of at least 3.30 and normally must have secured admission into an Honours Program in one of the participating Faculties. Students continue work in their discipline either in Calgary or abroad. The international experience is normally completed between the end of the Winter Term of Year 2 and the beginning of the Fall Term in Year 4.

Year 4: Students must maintain a GPA of at least 3.30. Students complete the final two courses (Arts and Science Honours Academy 501 and 503) and continue in their Honours or Major Program. In order to accommodate all the requirements of the Program and the international experience, time to graduation may be extended as appropriate.

4.2 African Studies

See Anthropology and Archaeology.

4.3 Ancient and Medieval History

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Ancient and Medieval History

BA in Ancient and Medieval History with Co-operative Education

BA Honours in Ancient and Medieval History

BA Honours in Ancient and Medieval History with Co-operative Education

Introduction

The BA and BA Honours programs in Ancient and Medieval History are offered jointly by the Department of History and the Department of Classics and Religion. There is no Minor program in Ancient and Medieval History. Students considering this Major should consult the Classics and Religion Advisor or Program Director.

Contact Information

Students considering this Major should consult with the Advisor in the Classics and Religion Department.

Department Office: Social Sciences 506

Phone: 403. 220.5537

Fax: 403.220.9581

Email: grst@ucalgary.ca

Website: grst.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Ancient and Medieval History) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework.

The application deadline is February 1. Interested students should consult with the History Advisor or the Classics and Religion Advisor well in advance.

Overlapping Programs

Programs in Ancient and Medieval History cannot be taken in conjunction with programs in either History or Greek and Roman Studies. This restriction applies to Major-plus-Minor combinations, Double Majors,

Combined Degrees and Second Baccalaureate Degrees.

Students may take a Minor in Greek or Latin in conjunction with a Major or Honours program in Ancient and Medieval History.

Field of Ancient and Medieval History

The Field of Ancient and Medieval History consists of the following courses:

- Greek and Roman Studies 305, 306, 315, 335, 337, 339, 341, 345, 347, 413, 415, 417, 419, 421, 423, 425, 433, 491 and 494.
- History 319, 321, 372, 496, 597 and 598.
- Philosophy 503.
- Religious Studies 357, 369, 383, 385, 387 and 484.

Note: Most of the courses listed above have prerequisites that lie outside the Field of Ancient and Medieval History. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

4.3.1 BA in Ancient and Medieval History

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Ancient and Medieval History while fulfilling the following requirements:

1. *Core Courses:* 15 units (2.5 full-course equivalents) from Greek and Roman Studies 341, 345 and 347; and History 319 and 321.

2. *Greek and Roman Studies Courses:* 6 units (1.0 full-course equivalent) from Greek and Roman Studies 305, 306, 315, 415, 417, 419.

3. *History Courses:* 6 units (1.0 full-course equivalent) from any of the Greek and Roman Studies courses included in the Major Field, which are not already being used to satisfy the *Greek and Roman Studies Courses*.

4. *Ancient and Medieval History Options:* An additional 21 units (3.5 full-course equivalents) from the Field of Ancient and Medieval History. Courses listed under requirements 2 and 3 but not used to fulfill those requirements may be included.

C. DEGREE OPTIONS

The BA in Ancient and Medieval History can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- 6 units (1.0 full-course equivalent) Latin is recommended in first year.
- Greek and Roman Studies 205 and History 201 are recommended in first year.

4.3.2 BA Honours Ancient and Medieval History

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Ancient and Medieval History while fulfilling the following requirements:

1. *Core Courses:* 18 units (3.0 full-course equivalents) from Greek and Roman Studies 341, 345 and 347; and History 319, 321, 323 and 496.

2. *Greek and Roman Studies Courses:* 6 units (1.0 full-course equivalent) from Greek and Roman Studies 305, 306, 315, 415, 417, 419.

3. *History Courses:* 6 units (1.0 full-course equivalent) from any of the Greek and Roman Studies courses included in the Major Field, which are not already being used to satisfy the *Greek and Roman Studies Courses*.

4. *Directed Readings:* History 597.

5. *Honours Thesis:* History 598.

6. *Ancient and Medieval History Options:* An additional 15 units (2.5 full-course equivalents) from the Field of Ancient and Medieval History. Courses listed under requirements 2 and 3 but not used to fulfill those requirements may be included.

C. OTHER REQUIREMENTS

Language Requirement: 12 units (2.0 full-course equivalents) in Latin.

D. DEGREE OPTIONS

The BA Honours in Ancient and Medieval History can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Greek and Roman Studies 205 and History 201 are recommended in first year.
- Latin 201 and 203 are recommended in first year.

4.4 Anthropology and Archaeology

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Social and Cultural Anthropology

BA Honours in Social and Cultural Anthropology

BA in Social and Cultural Anthropology with Co-operative Education

BA Honours in Social and Cultural Anthropology with Co-operative Education

Bachelor of Science (BSc) in Anthropology

BSc Honours in Anthropology

BSc in Anthropology with Co-operative Education

BSc Honours in Anthropology with Co-operative Education

Bachelor of Arts (BA) in Archaeology

BA Honours in Archaeology

BA in Archaeology with Co-operative Education

BA Honours in Archaeology with Co-operative Education

Bachelor of Science (BSc) in Archaeology

BSc Honours in Archaeology

BSc in Archaeology with Co-operative Education

BSc Honours in Archaeology with Co-operative Education

Bachelor of Arts (BA) in Development Studies

BA in Development Studies with Co-operative Education

BA Honours in Development Studies

BA Honours in Development Studies with Co-operative Education

Concurrent BA in Development Studies and Bachelor of Education

Notes:

- Minors are offered in African Studies, Anthropology, Archaeology, and Development Studies.
- A concentration is available in Physical Anthropology and can be taken in conjunction with all Archaeology degrees.

Introduction

The Department of Anthropology and Archaeology offers instruction in Archaeology, Anthropology, Physical Anthropology, Social and Cultural Anthropology, and African Studies. Degrees offered include a Bachelor of Arts and Bachelor of Science in Anthropology; a Bachelor of Arts and a Bachelor of Science in Archaeology; a Bachelor of Science in Archaeology with a concentration in Physical Anthropology; and a Bachelor of Arts in Development Studies. Students wishing to emphasize the social sciences and humanities in their Anthropology program should register for the BA degree. Those who wish to emphasize the natural and biological sciences in their Anthropology program should register for the BSc degree. Students wishing to emphasize the social sciences and humanities in their Archaeology program should register for the BA degree; those who wish to emphasize the natural and biological sciences in Archaeology should register for the BSc degree.

It is recommended that all Archaeology Majors, especially Honours students, take the field school courses (Archaeology 306, Archaeology 506) or a departmentally approved field school. Students must obtain a letter of permission from the Faculty of Arts through their student centre prior to attending a field school run by another university.

The Development Studies program is designed to provide students with an under-

standing of issues, policies, and practices associated with global development issues in the context of both Canada and developing countries. In addition to critical interdisciplinary perspectives for conceptualizing and analyzing issues, students will gain practical skills for designing, implementing and effectively managing community development projects. The program, therefore, prepares students for further studies, as well as for employment in governmental, non-governmental, and other international development-related fields in Canada and abroad.

Contact Information

Location: Earth Sciences 620

Phone: 403.220.6516

Fax: 403.284.5467

Email: anth@ucalgary.ca; destprog@ucalgary.ca

Website: antharky.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the Department of Anthropology and Archaeology (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Social and Cultural Anthropology, or Archaeology), the BA (Development Studies), or the BSc (Anthropology or Archaeology) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

Honours programs in Anthropology, Archaeology and Development Studies offer senior students the opportunity to participate in more inquiry-based studies than those undertaken by Majors. Entrance occurs after completion of at least 75 units (12.5 full-course equivalents). The Archaeology Honours program permits students to select one of three possible degree pathways: the Honours BA, the Honours BSc, and the Honours BA or BSc with a focus on Physical Anthropology.

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. The application deadline is February 1.

Field of Anthropology

The Field of Anthropology consists of all courses labelled Anthropology (ANTH) and Archaeology (ARKY) 203, 305, 419, 555, and 595.

Field of Archaeology

The Field of Archaeology consists of all courses labelled Archaeology (ARKY).

Notes:

- For students pursuing the Physical Anthropology concentration, Anthropology 311, 413 and 552 are included within the Field of Archaeology.
- Archaeology-related courses offered by other departments may, with the permission of the Archaeology Department, be accepted for credit towards the Major in an Archaeology program. In some instances the Department will permit credit by special assessment.

Natural Science Courses for the BSc Archaeology

As part of their programs, archaeology students normally take a mix of courses with a social-sciences emphasis and a natural-sciences emphasis. Bachelor of Science degrees in Archaeology put a greater focus on the natural sciences and require students to choose their Archaeology and option courses to include at least 48 units (8.0 full-course equivalents) from the following:

Archaeology Courses with a Natural-Science Emphasis

Archaeology 201, 203, 306, 413, 415, 417, 437, 453, 471, 506, 515, 533, 555, 589, 595, 596.

Supporting Courses in Natural Science

Anthropology 311, 413 and 552.

Geography 211, 305, 307, 313, 333, 357, 403, 411, 413, 415, 417, 433, 457, 503, 507, 509, 516, 519, 531, 533, 537, 567, 599.

All courses offered by the Faculty of Science.

Notes:

- The Department may determine that Archaeology 599 can be used as a Natural Sciences course, depending on the topic.
- Bachelor of Arts degrees in Archaeology have a social sciences emphasis and require students to choose their Archaeology and option courses to include no more than 48 units (8.0 full-course equivalents) from the courses listed above.

Field of Development Studies

The Field of Development Studies consists of the following courses:

- All courses labelled Development Studies (DEST)
- African Studies 301
- Anthropology 303, 313, 317, 319, 321, 323, 329, 331, 333, 341, 343, 349, 357, 385, 379, 393, 399, 411, 467, 479, 523
- Architectural Studies 423
- Biology 307, 309
- Canadian Studies 361
- Communication and Media Studies 313
- Economics 201, 203, 321, 337, 339, 349, 365, 377, 425
- Geography 205, 213, 251, 321, 340, 341, 367, 421, 425, 463, 553
- Health and Society 301
- History 300, 307
- Indigenous Studies 201, 303, 305, 311, 312, 317, 397, 399, 407, 415
- Political Science 279, 359, 371, 381, 399, 471, 487, 579
- Science, Technology and Society 325
- Sociology 303, 311, 313, 315, 375, 487
- University 207

Note: Most of the courses listed above have prerequisites that lie outside the Field of Development Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

Field of African Studies

The Field of African Studies consists of the following courses:

- African Studies 301, 400, 501
- Anthropology 317, 319, 505.40
- Archaeology 307, 395, 399
- French 549
- Geography 377
- Greek and Roman Studies 345, 347
- History 397.01
- Political Science 371, 471
- Religious Studies 339, 353
- Zoology 507.60, 507.61

Notes:

- Most of the courses listed above have prerequisites that lie outside the Field of African Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.
- The Faculty may approve additional courses in category 3 or 4 when they have significant African emphasis. For example, in some years Archaeology 531; Film 301; and/or Religious Studies 349 may be approved in category 3. Similarly, Economics 337, Geography 365, 425, 593; Political Science 279, 579; and/or Sociology 487 may be approved in category 4.

4.4.1 BA in Social and Cultural Anthropology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Anthropology while fulfilling the following requirements:

1. *Core:* 12 units (2.0 full-course equivalents) from Anthropology 201, 203, 391 and 411.

2. *Ethnography:* 6 units (1.0 full-course equivalent) from Anthropology 317, 319, 321, 323, 329, 355, 421, and 427.

3. *Upper-Year Courses:* 6 units (1.0 full-course equivalent) from Anthropology 402,

405, 421, 427, 467, 479, 501, 523, 541, and 573.

4. *Options:* 18 units (3.0 full-course equivalents) from courses labelled Anthropology.

C. DEGREE OPTIONS

The BA in Social and Cultural Anthropology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Anthropology 421 and 427 may be used to satisfy Requirement 3 if not already used to satisfy Requirement 2.
- Note that Upper-Year and Ethnography courses may not be offered every year. Planning ahead to ensure completion of these requirements is strongly recommended.
- Students contemplating applying to enter a graduate program in Anthropology or seeking an applied research position are encouraged to include among their open options a Statistics or Quantitative Methods course.

4.4.2 BA Honours Social and Cultural Anthropology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Anthropology while fulfilling the following requirements:

1. *Core:* 12 units (2.0 full-course equivalents) from Anthropology 201, 203, 391 and 411.

2. *Ethnography:* 6 units (1.0 full-course equivalent) from Anthropology 317, 319, 321, 323, 329, 355, 421, and 427.

3. *Upper-Year Courses:* 6 units (1.0 full-course equivalent) from Anthropology 402, 405, 421, 427, 467, 479, 501, 523, and 541.

4. *Anthropology Options:* 27 units (4.5 full-course equivalents) from courses labelled Anthropology.

5. *Capstone Seminar:* Anthropology 573.

C. DEGREE OPTIONS

The BA Honours in Social and Cultural Anthropology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Anthropology 421 and 427 may be used to satisfy Requirement 3 if not already used to satisfy Requirement 2.
- Note that Upper-Year and Ethnography courses may not be offered every year. Planning ahead to ensure completion of these requirements is strongly recommended.
- Students contemplating applying to enter a graduate program in Anthropology or seeking an applied research position are encouraged to include among their open options a Statistics or Quantitative Methods course.

4.4.3 BSc in Anthropology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Anthropology while fulfilling the following requirements:

1. *Core:* 12 units (2.0 full-course equivalents) from Anthropology 201, 203, 309, and 311.

2. *Upper-Year Courses:* 15 units (2.5 full-course equivalents) from Anthropology 331, 341, 404, 413, 425, 435, 441, 451, 505, 535, 552, 553, 571, and 589.

3. *Options:* An additional 15 units (2.5 full-course equivalents) from the Field of Anthropology.

C. DEGREE OPTIONS

The BSc in Anthropology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note:

- Students enrolled in the BSc program are advised to select their elective courses from Archaeology, Linguistics, Psychology, Statistics, and Biological Sciences offerings.

4.4.4 BSc Honours Anthropology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Anthropology while fulfilling the following requirements:

1. *Core:* 12 units (2.0 full-course equivalents) from Anthropology 201, 203, 309, and 311.

2. *Upper-Year Courses:* 15 units (2.5 full-course equivalents) from: Anthropology 331, 341, 404, 413, 425, 435, 441, 451, 505, 535, 552, 553, and 589.

3. *Options:* 24 units (4.0 full-course equivalents) from the Field of Anthropology.

4. *Capstone Seminar:* Anthropology 571.

C. DEGREE OPTIONS

The BSc Honours in Anthropology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note:

- Students enrolled in the BSc Honours program are advised to consult with the Undergraduate Director on the choice of both options and courses within the Major Field. Students should normally select their options from Archaeology, Linguistics, Psychology, Statistics, and Biological Sciences offerings.

4.4.5 Minor in Anthropology

The Minor in Anthropology is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from courses labelled Anthropology with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.4.6 BA in Archaeology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

BA students must successfully complete a minimum of 42 (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Archaeology while fulfilling the following requirements:

1. *Core*: 9 units (1.5 full-course equivalents) from Archaeology 201, 203, 451.

2. *Regional Archaeology*: 6 units (1.0 full-course equivalent) from Archaeology 303, 317, 321, 335, 341, 343, 351, 353, 357, 395, 401, 423, 437, 439, 455, 521, 537, 553.

3. *Archaeological Techniques*: 6 units (1.0 full-course equivalent) from Archaeology 306*, 413, 415, 417, 453, 471, 515, 533, 555.

**Archaeology 306 counts as 3 units (0.5 full-course equivalent) for this requirement.*

4. *Traditional Knowledge*: 6 units (1.0 full-course equivalent) from Anthropology 317, 319, 321, 329, 355, 405; Archaeology 307, 345, 355, 357, 399, 411, 419.

5. *Archaeology Options*: At least 15 units (2.5 full-course equivalents) from the Field of Archaeology. If Anthropology courses were used to fulfill requirement 4 above, increase the number of options by the number of Anthropology courses used.

6. *500-level Courses*: Inclusive of the courses used to fulfill requirements 2-5 above, 6 units (1.0 full-course equivalent) from Archaeology 503, 515, 521, 523, 531, 537, 553, 555, 589, 591, 593, 595.

C. DEGREE OPTIONS

- The BA in Archaeology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.
- The BA in Archaeology can be taken with a Concentration in Physical Anthropology (see Section 4.4.10).

4.4.7 BSc in Archaeology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

BSc students must successfully complete a minimum of 42 (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Archaeology while fulfilling the following requirements:

1. *Core*: 9 units (2.0 full-course equivalents) from Archaeology 201, 203, 451.

2. *Regional Archaeology*: 6 units (1.0 full-course equivalent) from Archaeology 303, 317, 321, 335, 341, 343, 351, 353, 357, 395, 401, 423, 437, 439, 455, 521, 537, 553.

3. *Archaeological Techniques*: 6 units (1.0 full-course equivalent) from Archaeology 306*, 413, 415, 417, 453, 471, 515, 533, 555.

**Archaeology 306 counts as 3 units (0.5 full-course equivalent) for this requirement.*

4. *Traditional Knowledge*: 66 units (1.0 full-course equivalent) from Archaeology 307, 345, 355, 357, 399, 411, 419; Anthropology 317, 319, 321, 329, 355, 405.

5. *Archaeology Options*: At least 15 units (2.5 full-course equivalents) from the Field of Archaeology. If Anthropology courses were used to fulfill requirement 4 above, increase the number of options by the number of Anthropology courses used.

6. *500-level Courses*: Inclusive of the courses used to fulfill requirements 2-5 above, 6 units (1.0 full-course equivalent) from Archaeology 503, 515, 521, 523, 531, 537, 553, 555, 589, 591, 593, 595.

7. *Natural Science Requirement*: Inclusive of the courses used to fulfill requirements 1 – 6 above, students must include a minimum of 48 units (8.0 full-course equivalents) from the list of "Natural Sciences Courses for the BSc Archaeology" (see 4.4 Field of Archaeology) in their degree.

C. DEGREE OPTIONS

- The BSc in Archaeology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.
- The BSc in Archaeology can be taken with a Concentration in Physical Anthropology (see Section 4.4.10).

4.4.8 BA Honours Archaeology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

BA students must successfully complete a minimum of 48 (8.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Archaeology while fulfilling the following requirements:

1. Core: 12 units (2.0 full-course equivalents) from Archaeology 201, 203, 451, and 505.
2. Regional Archaeology: 9 units (1.5 full-course equivalents) from Archaeology 303, 317, 321, 335, 341, 343, 351, 353, 357, 395, 401, 423, 437, 439, 455, 521, 537, 553.
3. Archaeological Techniques: 6 units (1.0 full-course equivalent) from Archaeology 306*, 413, 415, 417, 453, 471, 515, 533, 555.

   **Archaeology 306 counts as 3 units (0.5 full-course equivalent) for this requirement.*
4. Traditional Knowledge: 6 units (1.0 full-course equivalent) from Archaeology 307, 345, 355, 357, 399, 411, 419; Anthropology 317, 319, 321, 329, 355, 405.
5. Honours Thesis: Archaeology 596 or 598.
6. Archaeology Options: At least 9 units (1.5 full-course equivalents) from the Field of Archaeology. If Anthropology courses were used to fulfill requirement 4 above, increase the number of options by the number of Anthropology courses used.

C. OTHER REQUIREMENTS

1. Geology/Geography Requirement: 6 units (1.0 full-course equivalent) consisting of either (a) Geology 201 and 202; or (b) Geography 211 and 307.
2. Language/Computer Science Requirement: 6 units (1.0 full-course equivalent) consisting of:
   a. Linguistics 201 and 353;
   b. Computer Science 203 and 231 (or equivalents);
   c. 6 units (1.0 full-course equivalent) in a language other than English.
3. Statistics Requirement: 3 units (0.5 full-course equivalent) from Geography 339, 439; Psychology 312; Sociology 311, 315; Statistics 213, 217.

D. DEGREE OPTIONS

- The BA Honours in Archaeology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.
- The BA Honours in Archaeology can be taken with a Concentration in Physical Anthropology (see Section 4.5.3).

Notes:

- The Statistics requirement can also be fulfilled by demonstrating proficiency through examination by the Department.
- A foreign language is recommended for Honours students, especially those considering graduate work in Archaeology.
- Successful completion of the Honours program provides a good foundation for graduate work in Archaeology, but does not automatically ensure admission to the graduate program.
- It is strongly recommended that Honours students take the field school courses, Archaeology 306 and Archaeology 506, or other department-approved field-school courses. Students must obtain a letter of permission from the Faculty of Arts through their Student Centre prior to attending a field school run by another university.

4.4.9 BSc Honours Archaeology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

BSc students must successfully complete a minimum of 48 (8.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Archaeology while fulfilling the following requirements:

1. *Core*: 12 units (2.0 full-course equivalents) from Archaeology 201, 203, 451, and 505.
2. Regional Archaeology: 9 units (1.5 full-course equivalents) from Archaeology 303, 317, 321, 335, 341, 343, 351, 353, 357, 395, 401, 423, 437, 439, 455, 521, 537, 553.
3. *Archaeological Techniques*: 6 units (1.0 full-course equivalent) from Archaeology 306*, 413, 415, 417, 453, 471, 515, 533, 555.

   **Archaeology 306 counts as 3 units (0.5 full-course equivalent) for this requirement.*
4. *Traditional Knowledge*: 6 units (1.0 full-course equivalent) from Archaeology 307, 345, 355, 357, 399, 411, 419; Anthropology 317, 319, 321, 329, 355, 405.
5. *Honours Thesis*: Archaeology 596 or 598.
6. *Archaeology Options*: At least 9 units (1.5 full-course equivalents) from the Field of Archaeology. If Anthropology courses were used to fulfill requirement 4 above, increase the number of options by the number of Anthropology courses used.
7. *Natural Science Requirement*: Inclusive of the courses used to fulfill requirements 1 – 6 above, students must include a minimum of 48 units (8.0 full-course equivalents) from the list of "Natural Sciences Courses for the BSc Archaeology" (see 4.4 Field of Archaeology) in their degree.

C. OTHER REQUIREMENTS

1. Geology/Geography Requirement: 6 units (1.0 full-course equivalent) consisting of either (a) Geology 201 and 202; or (b) Geography 211 and 307.
2. Language/Computer Science Requirement: 6 units (1.0 full-course equivalent) consisting of:
   a. Linguistics 201 and 353 or
   b. Computer Science 203 and 231 (or equivalents) or
   c. 6 units (1.0 full-course equivalent) in a language other than English.
3. Statistics Requirement: 3 units (0.5 full-course equivalent) from Geography 339, 439; Psychology 312; Sociology 311, 315; Statistics 213, 217.

D. DEGREE OPTIONS

- The BSc Honours in Archaeology can be taken with Co-operative Education. See section 3.4.4 Co-operative

Education Programs for information and requirements.

- The BSc Honours in Archaeology can be taken with a Concentration in Physical Anthropology (see Section 4.4.10).

Notes:

- The Statistics requirement can also be fulfilled by demonstrating proficiency through examination by the Department.
- A foreign language is recommended for Honours students, especially those considering graduate work in Archaeology.
- Successful completion of the Honours program provides a good foundation for graduate work in Archaeology, but does not automatically ensure admission to the graduate program.
- It is strongly recommended that Honours students take the field school courses, Archaeology 306 and Archaeology 506, or other department-approved field-school courses. Students must obtain a letter of permission from the Faculty of Arts through their Student Centre prior to attending a field school run by another university.

4.4.10 Concentration in Physical Anthropology

Archaeology students may declare a Concentration in Physical Anthropology, which requires the completion of 12 units (2.0 full-course equivalents) in specified courses and a modified Archaeological Techniques Requirement:

1. *Archaeology*: 6 units (1.0 full-course equivalent) from Archaeology 305 and 555.
2. *Biology*: Biology 241.
3. *Primatology*: 3 units (0.5 full-course equivalent) from Anthropology 311, 413.
4. *Archaeological Techniques*: 3 units (0.5 full-course equivalent) from:
   a. Archaeology 415, 417, 471, 595
   b. 3 units (0.5 full-course equivalent) from Archaeology 306, 413, 453, 515, 533; Anthropology 552.

Notes:

- For students pursuing the Physical Anthropology concentration, Anthropology 311, 413 and 552 are included within the Field of Archaeology.
- For students in the BA or BSc (non-Honours) Archaeology streams pursuing a Concentration in Physical Anthropology, requirement 4 above replaces the Archaeological Techniques requirement listed as B.3 in Section 4.4.1 or Section 4.4.7, as appropriate.
- For students in the BA or BSc Honours Archaeology streams pursuing a Concentration in Physical Anthropology, requirement 4 above replaces the Archaeological Techniques requirement listed as B.3 in Section 4.4.8 or Section 4.4.9, as appropriate.
- Students in the BA or BSc (non-Honours) Archaeology streams pursuing a Concentration in Physical Anthropology are exempt from the Regional Archaeology Requirement listed as B.2 in Section 4.4.6 or Section 4.4.7, as appropriate.
- Students in the BA or BSc Honours Archaeology streams pursuing a Concentration in Physical Anthropology are exempt from the requirement to take Archaeology 501 or 505 listed in B.1 in Section 4.4.8 or 4.4.9 (as appropriate) and the Regional Archaeology Requirement listed as B.2 in Section 4.4.8 or 4.4.9 (as appropriate) is reduced from 9 to 6 units (1.5 to 1.0 full-course equivalents).

4.4.11 Minor in Archaeology

The Minor in Archaeology is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Archaeology with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.4.12 BA in Development Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) in the field of Development Studies and fulfill the following requirements:

1. *Core Courses*: 12 units (2.0 full-course equivalents) including: Development Studies 201, 393, Economics 201, and 203.
2. *Research Methods Requirement*: 3 units (0.5 full-course equivalent) from Anthropology 411, Communication and Media Studies 313, Geography 340, History 300, Political Science 399 or Sociology 311 or 313.
3. *Development Studies Options*: An additional 30 units (5.0 full-course equivalents) chosen from the Field of Development Studies.
4. *Upper-Level Options*: Inclusive of the courses used to fulfill requirements 2-3 above, at least 6 units (1.0 full-course equivalent) must be at the 400 level or above including at least 3 units (0.5 full-course equivalent) labelled Development Studies.
5. *Capstone Seminar*: Development Studies 591.

C. OTHER REQUIREMENTS

1. *Language Requirement*: 6 units (1.0 full-course equivalent) in a modern language other than English. Students should select a language that will assist in their research or complement a regional focus.

D. DEGREE OPTIONS

The BA in Development Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.4.13 BA Honours in Development Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) in the Field of Development Studies and fulfill the following requirements:

1. *Core Courses*: 12 units (2.0 full-course equivalents) including Development Studies 201, 393, Economics 201, and 203.
2. *Research Methods Requirement*: 3 units (0.5 full-course equivalent) from Anthropology 411, Communication and Media Studies 313, Geography 340, History 300, Political Science 399, or Sociology 311 or 313.
3. *Development Studies Options*: An additional 33 units (5.5 full-course equivalents) from the Field of Development Studies.
4. *Upper-Level Options:* Inclusive of the courses used to fulfill requirements 2-3 above, at least 6 units (1.0 full-course equivalent) must be at the 400 level or above including at least 3 units (0.5 full-course equivalent) labelled Development Studies.
5. *Capstone Seminar*: Development Studies 591.
6. *Honours Seminar*: Development Studies 593.

C. OTHER REQUIREMENTS

1. *Language Requirement*: 6 units (1.0 full-course equivalent) in a modern language other than English. Students should select a language that will assist in their research or complement a regional focus.

D. DEGREE OPTIONS

The BA Honours in Development Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.4.14 Minor in Development Studies

The Minor in Development Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Development Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above including:

1. Development Studies 201 and 393.
2. An additional 24 units (4.0 full-course equivalents) from within the Field of Development Studies.

Note: In addition to the requirements for the minor, competence in a modern language other than English is highly recommended.

4.4.15 Minor in African Studies

The Minor in African Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) while meeting the requirements below:

1. African Studies 301, 501.

2. 6 units (1.0 full-course equivalent) from the following: Anthropology 317, 319; Political Science 371.

3. At least 12 additional units (2.0 full-course equivalents) from the following: African Studies 400; Anthropology 317, 319, 505.40; Archaeology 395, 399; French 549; Geography 377; History 397.01; Political Science 371, 471; Religious Studies 339; Zoology 507.60, 507.61.

4. At least 6 units (1.0 full-course equivalent) from the following: Archaeology 307; Greek and Roman Studies 345, 347; Religious Studies 353.

Note: In addition to the courses mentioned above, students should realize that competence in a language (other than English) appropriate to the study of Africa is highly desirable.

4.5 Archaeology

See Anthropology and Archaeology.

4.6 Applied Energy Economics - Collaborative Program

See Economics.

4.7 Architectural Studies

The Minor in Architectural Studies is now administered and delivered by the Faculty of Environmental Design. Please consult their section of the calendar at: ucalgary.ca/pubs/calendar/current/ev-4.html.

4.8 Art

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Art History

Bachelor of Fine Arts (BFA) in Visual Studies

Bachelor of Fine Arts Honours in Visual Studies

Bachelor of Fine Arts (BFA) in Visual Studies with Co-operative Education

Bachelor of Fine Arts Honours in Visual Studies with Co-operative Education

Concurrent BFA in Visual Studies/Bachelor of Education

Notes:

- Applications to the BA in Art History have been suspended while the program is under review. Students currently in Art History should consult with the Arts Students' Centre for program advice.
- For the BFA or BFA Honours in Visual Studies students may choose a Concentration in Art Education or a Concentration in Media Arts.
- A Minor is offered in Visual Studies and Art History.
- The Department of Art offers a Minor Field of specialization in Museum and Heritage Studies. This Minor program is intended to develop a critical and analytical perspective on the issues and future of museum and heritage resources. These encompass national parks and heritage sites, museums and art galleries, archives and historic buildings.

Introduction

The Department of Art is committed to the study and practice of the visual arts as these relate to:

(a) Creative research in art practices (studio);

(b) Educational practice and theory (Art Education); and

(c) To the understanding of art in its diverse historical and cultural settings (Art History).

The Department offers the four-year BFA and BFA Honours (Visual Studies) degree and a five-year concurrent degree program with the Werklund School of Education, leading to the BFA (Visual Studies) and Bachelor of Education degrees.

Students who elect the four-year BFA and BFA Honours (Visual Studies) programs do so in order to better realize themselves through study and active involvement in art as related to contemporary society and culture. The courses of study enable the student to develop conceptual understanding in the visual arts, to develop a foundation of knowledge and practice of artistic self-sufficiency, to develop creative processes of planning in order to carry out his or her various studio interests, and to teach art in the elementary or secondary school systems or to work as art specialists in other settings. The program enables the individual student to determine through studio practice the understandings and insights that support his or her own artistic and intellectual development. Students interested in teacher certification may pursue the concurrent degree program with the Werklund School of Education, which offers three years of study in the Visual Studies program and two years in the Bachelor of Education program. The Visual Studies program provides a core of work in the theory and methodology of art education, as well as a foundation in studio art and Art History.

The BA (Art History) is a four-year degree program requiring a minimum of 42 units (7.0 full-course equivalents) in Art History. It offers the student a general survey and understanding of the History of Art, and exposure to critical analysis.

Contact Information

Department Location: Art Building 612

Department Phone: 403.220.5251/403.220.6260

Department Fax: 403.289.7333

Department Email: jaffer@ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the Department of Art (consult Department website for contact information).

Admission to the BFA in Visual Studies

Admission to the BFA (Visual Studies) program is contingent on the evaluation of a portfolio, which must be received by the department by February 1. For information about the portfolio submission process, see the Department of Art website under art.ucalgary.ca/undergraduate/prospective-students#portfolio.

Prospective students must also meet the criteria in the section of this Calendar on meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

Students wishing to be considered for admission into BFA Honours in Visual Studies must be entering the fourth year of their program and must meet the criteria established by the Faculty of Arts in section 3.4.2 Honours Degrees with a Major Field. In addition to completing the online application in the Student Centre, students must submit a Letter of Intent and a portfolio of work to the Department of Art. Information on the supplemental components can be found on the Department of Art website. The application deadline is February 1.

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework.

Students majoring in Visual Studies are eligible to apply for Honours by the February 1 deadline only if they will complete the program during the following academic year. In addition to completing an application in the online Student Centre by the February 1 deadline, students must submit a portfolio of work and a statement of intent to the Department of Art. The application form must be signed by a thesis supervisor and include preliminary thesis proposal. To meet the February 1 deadline, it is recommended that students wishing to enrol in the Honours program obtain guidelines and an application form from the Program Co-ordinator no later than December 1. Students are strongly advised to secure a thesis supervisor by December 15.

Limitation of Enrolment

Enrolment in the Visual Studies program is limited, and thus not all qualified applicants may be admitted.

Applicants will be accepted on the basis of their portfolios and their academic standing

in high school and/or previous post-secondary education completed.

Students who are accepted must register by the deadline indicated in their letters of acceptance. Admission is not guaranteed to those who do not register by the specified date.

Admission to the BA in Art History

Applications to the BA in Art History have been suspended while the program is under review.

Prospective students wishing to enter the BA (Art History) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Limitation of Enrolment

Enrolment in Art History is limited. Therefore, not all qualified applicants may be admitted. Applicants will be accepted on the basis of academic standing in high school and/or previous post-secondary education completed.

Fields of Study Related to Art Programs

Field of Art History

The Field of Art History consists of all courses labelled Art History (ARHI) as well as the following:

Courses in Visual Culture

- Canadian Studies 341, 433
- Drama 342, 344
- Film 301, 305, 307
- Greek and Roman Studies 325, 327, 445, 447
- Philosophy 317, 333

Context Courses

- Archaeology 325
- Communication and Culture 301, 303
- East Asian Studies 331, 333
- Greek and Roman Studies 339, 341, 345, 347
- History 321, 327, 333
- Philosophy 301, 303, 305, 309, 311, 335
- Religious Studies 399

Field of Art

The broader Field of Art consists of all courses labelled Art (ART) and Art History (ARHI).

Field of the Fine Arts

The still broader Field of the Fine Arts consists of all course labelled Art (ART), Art History (ARHI), Dance (DNCE), Drama (DRAM), Film (FILM), Fine Arts (FINA), Music (MUSI), Music Education (MUED), Music Performance (MUPF), and School of Creative and Performing Arts (SCPA).

Field of Museum and Heritage Studies

The Field of Museum and Heritage Studies consists of the following courses:

- All courses labelled Museum and Heritage Studies (MHST)
- Anthropology 203
- Archaeology 201, 303, 306, 307, 415, 417, 419
- Art 205 and all ART courses at the 300 level or above
- Art History 201, 203 and all Art History (ARHI) courses at the 300 level or above
- Astronomy 207, 209
- Biology 307
- All Canadian Studies 300-level and above
- Communication and Culture 301, 303, 507
- Communication and Media Studies 313
- Development Studies 485
- Drama 223, 225, 313, 319
- Geography 251, 361
- Geology 201 or 209, 202
- Greek and Roman Studies 321, 325, 327, 445
- History 333, 337, 340, 341, 347, 357, 437, 451, 476
- Marketing 341
- Philosophy 333
- Political Science 357
- Religious Studies 205
- Science, Technology and Society 325, 327
- Tourism Management 409

Notes:

- Students taking degrees with majors that require Communication and Culture 301, 303, or Communication and Media Studies 313 may not count these courses as part of the Museum and Heritage Studies Minor.
- Credit will not be given for both Geology 201 and 209.
- Most of the courses listed above have prerequisites that lie outside the Field of Museum and Heritage Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

4.8.1 BFA in Visual Studies

Students may choose the Art Education Concentration, or follow the general BFA Visual Studies program without selecting a concentration (requirements shown below).

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

The BFA in Visual Studies requires the successful completion of 63 units (10.5 full-course equivalents) to 78 units (13.0 full-course equivalents) in the Field of Art with the following requirements:

33 units (5.5 full-course equivalents) from the following required courses:

- Art 231, 233, 241, 243, 251 and 253
- Art History 201 or 203 and Art History 209
- Art 327, 329, 399
- Art 301 or 401

36 units (6.0 full-course equivalents) from the following Art and Art History Options:

- 30 units (5.0 full-course equivalents) from the Field of Art at the 300 level or above
- 6 units (1.0 full-course equivalent) from the Field of Art History at the 300 level or above

C. OTHER REQUIREMENTS

- 9 units (1.5 full-course equivalents) from the Field of Fine Arts with 6 units (1.0 full-course equivalent) at the 300 level or above.
- 3 units (0.5 full-course equivalent) in junior English

D. DEGREE OPTIONS

The BFA in Visual Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements. The BFA in Visual Studies can be taken with a concentration in Art Education (see Section 4.8.4).

4.8.2 BFA Honours Visual Studies

The Honours degree in Visual Studies is an advanced undergraduate program for students seeking a more focused studio experience, aspiring to careers as practicing and professional artists, or considering further graduate level study in an MFA program. The Honours degree requires students to complete a minimum of an additional 15 units (2.5 full-course equivalents) in the Field of Art beyond the requirements for the general BFA in Visual Studies. A high standard of creative achievement is required for admission, continuation, and completion.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

The BFA Honours in Visual Studies requires the successful completion of 78 (13.0 full-course equivalents) to 96 units (16.0 full-course equivalents) in the Field of Art with the following requirements:

63 units (10.5 full-course equivalents) from the following required courses:

- Art 231, 233, 241, 243, 251 and 253
- Art History 201 or 203 and Art History 209
- Art 301, 327, 329, 399
- Art 401, 461, 499
- Art 560, 561, 563 and 599
- Two courses from the following: Art 331 and 334 or Art 341 and 343 or Art 345 and 347 or Art 351 and 353 or Art 381 and 383 or Art 336 and 338

27 units (4.5 full-course equivalents) from the following Art and Art History Options:

- 15 units (2.5 full-course equivalents) from the Field of Art at the 300 level or above
- 12 units (2.0 full-course equivalents) from the Field of Art History at the 300 level or above

C. OTHER REQUIREMENTS

- 6 units (1.0 full-course equivalents) from the Field of Fine Arts with 3 units (0.5

full-course equivalent) at the 300 level or above

- 3 units (0.5 full-course equivalent) in junior English

D. DEGREE OPTIONS

The BFA Honours in Visual Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements. The BFA Honours in Visual Studies can be taken with a concentration in Art Education (see Section 4.8.5).

4.8.3 BA in Art History

Note: Applications to this program are currently suspended while the program is under review. Students currently in Art History should consult with the Arts Students' Centre for program advice.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 (10.0 full-course equivalents) in the Field of Art History and a maximum of 72 units (12.0 full-course equivalents) in the broader Field of Art while fulfilling the following requirements:

1. *Core Courses:* 12 units (2.0 full-course equivalents) from Art History 201, 203, 501 and 503.

2. *Special Topics and Seminars:* 6 units (1.0 full-course equivalent) from: Art History 411.01, 411.02, 511.

3. *Art History Options:* an additional 24 units (4.0 full-course equivalents) in Art History at the 300 level or above.

C. OTHER REQUIREMENTS

1. *English:* 6 units (1.0 full-course equivalent) in English.

2. *Fine Arts:* 12 units (2.0 full-course equivalents) in courses from outside the Field of Art History but within the Field of Fine Arts.

Notes:

- It recommended that students take at least 6 units (1.0 full-course equivalent) in studio art.
- It is recommended that students take at least 3 units (0.5 full-course equivalent) in a second language.
- If courses in studio art (labelled Art) are used to fulfill or partially fulfill requirement C.2, these courses count toward the maximum of 72 units (12.0 full-course equivalents) allowed in the Field of Art.

4.8.4 Concurrent BFA (Visual Studies)/BEd

Introduction

This five-year program leads to a Bachelor of Education from the Werklund School of Education and a Bachelor of Fine Arts in Visual Studies from the Faculty of Arts. A minimum of 150 units (25.0 full-course equivalents) must be successfully completed.

Present certification requirements of the Province of Alberta can be satisfied. When planning courses, students should take into consideration Alberta Teacher Certification Requirements. For details, refer to the Werklund School of Education website.

Admission

Students must meet the admissions requirements for the Werklund School of Education and the BFA (Visual Studies) program (see the Overview of Programs and Procedures) as well as the requirements of the Faculty of Arts (see A.2 Undergraduate Admission). Note that admission to the BFA (Visual Studies) program is contingent on the evaluation of a portfolio (see "Admission to the BFA in Visual Studies").

Faculty of Arts Requirements

A. FACULTY OF ARTS REQUIREMENTS FOR CONCURRENT DEGREES

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

BFA Visual Studies Requirements

Students must successfully complete 66 units (11.0 full-course equivalents) to 72 units (12.0 full-course equivalents) in the Field of Art with the following requirements:

54 units (9.0 full-course equivalents) from the following required courses:

- Art 205, 231, 233, 241, 243, 251 and 253
- Art History 201 or 203 and Art History 209
- Two of Art 305, 307 or 393
- Art 327, 329, 399
- Art 301 or Art 401
- Art 491
- Art 509, 515 and 591

18 units (3.0 full-course equivalents) from the following Art and Art History Options:

- 12 units (2.0 full-course equivalents) from the Field of Art at the 300 level or above
- 6 units (1.0 full-course equivalent) from the Field of Art History at the 300 level or above

C. OTHER REQUIREMENTS

- 3 units (0.5 full-course equivalent) from the Field of Fine Arts not labelled Art or Art History
- 3 units (0.5 full-course equivalent) in English at the 200 level.

Werklund School of Education Requirements

Students in this program must meet the requirements (60 units or 10.0 full-course equivalents) for the BEd degree. For additional requirements of the Werklund School of Education, see 4. BEd Program Details in their part of the calendar.

4.8.5 Concentration in Art Education

Students may focus their program by including a specified set of courses in their Major or Honours degree. The designation "Art Education Concentration" will appear on the transcripts of Majors who have completed the following courses in fulfillment of their BFA (Visual Studies) degree:

27 units (4.5 full-course equivalents) from the following:

- Art 205
- Two of Art 305, 307 and 393
- Art 399
- Art 491
- Art 509, 515 and 591
- One of Art 499 or Canadian Studies 433

4.8.6 Minor in Visual Studies and Art History

The Minor in Visual Studies and Art History is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Art (including all courses labelled Art and Art History) with at least 15 units (2.5 full-course equivalents) at the 300 level or above.

Note: To meet prerequisite requirements, students who wish to take senior courses in Art should take Art 241, 251 and at least one of Art 231, 233, 243 or 253. Students who wish to take senior courses in Art History should take Art History 201 and 203.

4.8.7 Concentration in Media Arts

In addition to offering comprehensive programs in the visual and performing arts, the Faculty of Arts is committed to exploring relationships among the arts that are fostered by new media technologies. For students in programs in Art, Dance, Drama and Music, the concentration must include courses from at least two areas other than the student's major program. Students whose major is other than Art, Dance, Drama, or Music, the concentration must include courses from at least two of the areas listed below. Anyone interested in acquiring this concentration should consult with an advisor for art, dance, drama or music at an early stage of planning as some of the courses listed below have prerequisites and/or may not always be offered every year.

Requirements

Students can acquire a Concentration in Media Arts by selecting a minimum of six courses from the following:

- Art 251, 253, 311, 313, 315, 317, 321, 331, 334, 335, 405, 431, 501, 503
- Dance 571
- Drama 317
- Fine Arts 507
- Music 351, 451, 453

4.8.8 Minor in Museum and Heritage Studies

The Minor in Museum and Heritage Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the list of requirements below with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

1. Museum and Heritage Studies 201, 331, 433, 533.
2. 18 to 24 units (3.0 to 4.0 full-course equivalents) from the Field of Museum and Heritage Studies.

Note:

- Many of the courses listed have prerequisites. It is the student's responsibility to ensure that prerequisites are completed.

4.9 Art History

Note: Applications to this program have been suspended while the program is under review. Students currently in Art History should consult with the Arts Students' Centre for program advice.

4.10 Asian Studies

See South Asian Studies. For East Asian Studies see Linguistics, Languages, and Culture.

4.11 Canadian Studies

See History.

4.12 Chinese

See Linguistics, Languages, and Culture.

4.13 Classics and Religion

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Degrees in Ancient and Medieval History

BA in Ancient and Medieval History

BA in Ancient and Medieval History with Co-operative Education

BA Honours in Ancient and Medieval History

BA Honours in Ancient and Medieval History with Co-operative Education

Degrees in Greek and Roman Studies

Bachelor of Arts (BA) in Greek and Roman Studies

BA in Greek and Roman Studies with Co-operative Education

BA Honours in Greek and Roman Studies

BA Honours in Greek and Roman Studies with Co-operative Education

Degrees in Religious Studies

Bachelor of Arts (BA) in Religious Studies

BA in Religious Studies with Co-operative Education

BA Honours in Religious Studies

BA Honours in Religious Studies with Co-operative Education

Related Interdisciplinary Degrees (See separate listings)

BA in Religious Studies and Applied Ethics*

**Applications to this program are currently suspended. No new admissions will be permitted.*

Notes:

- Minors are offered in Greek and Roman Studies, Greek, Latin, Religious Studies, and South Asian Studies.
- Concentrations are available in Philosophy and Religion, and South Asian Studies.

Introduction

The Department of Classics and Religion offers instruction in Greek and Roman Studies, Religious Studies, and Ancient and Medieval History.

Greek and Roman Studies: Greek and Latin language and literature, in Greek, Roman, and late antique history and archaeology, and in the more general area of ancient Mediterranean civilizations.

Both Greek and Latin may be started at the University. The relevant courses are Greek 201 and Greek 203, and Latin 201 and Latin 203. Advanced placement to Greek 301 or Latin 301 may be granted at the discretion of the Department to those students who have Greek 30, Latin 30 or an equivalent background.

Students majoring in the Department are encouraged to choose a related Minor Field. Related disciplines include: Anthropology, Art, English, French, German, History, Italian, Linguistics, Philosophy, Political Science, Religious Studies, Sociology and Spanish. There are also related interdisciplinary minor programs such as Medieval, Renaissance and Reformation Studies.

Religious Studies: Religious Studies seeks to foster an understanding of the wide variety of religions that have influenced the development of human cultures and that continue to be powerful forces in today's world. Courses examine religious worldviews and their associated texts and practices, movements and institutions, as they appear now and as they have developed over time in many cultures of the world. The Field of Religious Studies is multicultural, i.e., religions from all over the world are the subject of study, including the ancient traditions of Hinduism, Buddhism, Daoism, Confucianism, Judaism, Christianity, and Islam, as well as religious movements of more recent origin. Religious Studies is also multidisciplinary, which means that religion is studied with the use of methods and theories from various disciplines, including history, anthropology, philosophy, sociology, psychology, literary theory, and feminist theory.

Courses in the Field of Religious Studies are divided into three streams: Western Religions, Eastern Religions, and the Nature of Religion. Students are required to take courses in each of the three streams. A student may define a focus of study within a stream or thematically across streams. Students are encouraged to consult with the Department's Undergraduate Advisor regularly throughout their Undergraduate careers.

Students are strongly advised to include in their programs relevant language courses (e.g., Classical Hebrew, Greek, Latin, Sanskrit, Tibetan, Chinese, Japanese, French, German) and relevant courses from other disciplines.

Ancient and Medieval History: The BA and BA Honours programs in Ancient and Medieval History are offered by the Department of Classics and Religion. There is no Minor program in Ancient and Medieval History. Students considering this Major should consult the Classics and Religion Advisor or Program Director.

Contact Information

Department Office: Social Sciences 558

Phone: 403.220.5886

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Website: clare.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the Department of Classics and Religion (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Ancient and Medieval History), BA (Greek and Roman Studies) or BA (Religious Studies) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. The application deadline is February 1.

Overlapping Programs

Programs in Greek and Roman Studies cannot be taken in conjunction with Ancient and Medieval History. This restriction applies to Double Majors, Combined Degrees and Second Baccalaureate Degrees and also to most Major-plus-Minor combinations. A maximum of 60 units (10.0 full-course equivalents) is allowed in any discipline within the Major Field of Greek and Roman Studies.

Minors in Greek or Latin may be taken in conjunction with degrees in Ancient and Medieval History.

Minors in Greek or Latin can only be taken in conjunction with the program in Linguistics and Language if the Language Option for that program differs from the language of the Minor.

Programs in Religious Studies cannot be taken in conjunction with programs in Religious Studies and Applied Ethics. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of Ancient and Medieval History

The Field of Ancient and Medieval History consists of the following courses:

- Archaeology 325, 341, 343, 345, 353, 357, 401, 419, 423 and 439
- Greek and Roman Studies 305, 306, 315, 335, 337, 339, 341, 345, 347, 413, 415,

417, 419, 421, 423, 425, 433, 491, 494, 499, 501 and 503

- History 319, 321 and 496
- Philosophy 301, 303, 401, 403 and 501
- Religious Studies 303, 305, 313, 317, 319, 323, 327, 329, 357, 359, 369, 383, 385, 387, 451, 453, 461, 469, 484 and 590

Note: Most of the courses listed above have prerequisites that lie outside the Field of Ancient and Medieval History. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

Field of Greek and Roman Studies

The Field of Greek and Roman Studies consists of all courses labelled Greek and Roman Studies (GRST), Greek (GREK), and Latin (LATI).

Field of Religious Studies

The Field of Religious Studies consists of all courses labelled Religious Studies (RELS), Philosophy (PHIL) 331, 335, and 527, and Greek and Roman Studies (GRST) 499. Courses in the Field of Religious Studies are divided into Eastern, Western and Nature of Religion streams as indicated in the table under Religious Studies courses of instruction.

Religious Studies 373, 399, 491 and 595 will be designated as Western, Eastern or Nature of Religion depending on the topic covered. Religious Studies 377, 577 and 590 are not counted in any of the three streams.

Field of South Asian Studies

The Field of South Asian Studies consists of the following courses:

- South Asian Studies 203, 303, 499, 531
- Art History 323
- History 404, 406
- Religious Studies 203, 303, 307, 310, 312, 313, 317, 323, 327, 353, 451, 453

Notes:

- Most of the courses listed above have prerequisites that lie outside the Field of South Asian Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.
- When the content is applicable and with permission of the Program Co-ordinator, Archaeology 325; English 490; History 205, 301, 307, 488; Political Science 359 and Religious Studies 491 may be used as courses with a focus on South Asia.
- Courses taken on a term abroad program may also be approved. Both individual-study and field-school programs in South Asia are potentially eligible.

4.13.1 BA in Ancient and Medieval History

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Ancient and Medieval History while fulfilling the following requirements:

1. Core Courses:
   a. 12 units (2.0 full-course equivalents) from Greek and Roman Studies 341, 345 and 347; and History 319 and 321.
   b. 12 units (2.0 full-course equivalents) from Religious Studies 303, 313, 319, 323, 327, 329, 357, 359, 383, 385 and 387.
2. Advanced Courses: 6 units (1.0 full-course equivalent) from Greek and Roman Studies 415, 417, and 419; Religious Studies 451, 453, 461, 469 and 484.
3. Ancient and Medieval History Options: An additional 18 units (3.0 full-course equivalents) from the Field of Ancient and Medieval History. Courses listed under requirements 1 and 2 but not used to fulfill those requirements may be included.

C. DEGREE OPTIONS

The BA in Ancient and Medieval History can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- 6 units (1.0 full-course equivalent) of Latin is recommended in first year.
- Greek and Roman Studies 205 and History 201 are recommended in first year.

4.13.2 BA Honours in Ancient and Medieval History

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Ancient and Medieval History while fulfilling the following requirements:

1. Core Courses:
   a. 12 units (2.0 full-course equivalents) from Greek and Roman Studies 341, 345 and 347; and History 319 and 321.
   b. 12 units (2.0 full-course equivalents) from Religious Studies 303, 313, 319, 323, 327, 329, 357, 359, 383, 385 and 387.
2. Advanced Courses: 6 units (1.0 full-course equivalent) from Greek and Roman Studies 415, 417, and 419; Religious Studies 451, 453, 461, 469 and 484.
3. Historiography Course: Greek and Roman Studies 499.
4. Honours Thesis: Greek and Roman Studies 504 or Religious Studies 590.
5. Ancient and Medieval History Options: An additional 15 units (2.5 full-course equivalents) from the Field of Ancient and Medieval History. Courses listed under requirements 1 and 2 but not used to fulfill those requirements may be included.

C. OTHER REQUIREMENTS

Language Requirement: 12 units (2.0 full-course equivalents) in Latin

D. DEGREE OPTIONS

The BA Honours in Ancient and Medieval History can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: Greek and Roman Studies 205; History 201; Latin 201 and 203 are recommended in first year.

4.13.3 BA in Greek and Roman Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Greek and Roman Studies while fulfilling the following requirements:

1. 300-Level Courses: 18 units (3.0 full-course equivalents) labelled Greek and Roman Studies at the 300 level.

2. Upper-Level Courses: 12 units (2.0 full-course equivalents) from the Field of Greek and Roman Studies (inclusive of courses in Greek and Latin) at the 400 or 500 levels.

3. Greek and Roman Studies Options: 18 units (3.0 full-course equivalents) from the Field of Greek and Roman Studies (inclusive of courses in Greek and Latin). Greek and Roman Studies 205 and 209 are recommended in first year.

4. Language Requirement: 6 units (1.0 full-course equivalent) in a language other than English, which will normally be Greek or Latin. Courses taken in Greek (GREK) and/or Latin (LATI) also count toward requirements 2 or 3 as applicable.

C. DEGREE OPTIONS

The BA in Greek and Roman Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: For requirements 2 and 3, up to 6 units (1.0 full-course equivalent) may be

substituted from Philosophy 301 and 501 and History 319.

4.13.4 BA Honours in Greek and Roman Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 69 units (11.5 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Greek and Roman Studies while fulfilling the following requirements:

1. 300-Level Courses: 18 units (3.0 full-course equivalents) labelled Greek and Roman Studies at the 300 level.

2. Capstone: Greek and Roman Studies 504 and an additional 3 units (0.5 full-course equivalent) at the 500 level from the Field of Greek and Roman Studies (inclusive of courses in Greek and Latin).

3. Upper-Level Courses: An additional 12 units (2.0 full-course equivalents) at the 400 or above from the Field of Greek and Roman Studies (inclusive of courses in Greek and Latin).

4. Greek and Roman Studies Options: 30 units (5.0 full-course equivalents) from the Field of Greek and Roman Studies (inclusive of courses in Greek and Latin). Greek and Roman Studies 205 and 209 are recommended in first year.

5. Language Requirement: 18 units (3.0 full-course equivalents) in either Greek (GREK) or Latin (LATI) or 12 units (2.0 full-course equivalents) in each of these languages. Courses taken in Greek and/or Latin also count toward requirements 2 or 3 as applicable.

C. DEGREE OPTIONS

The BA Honours in Greek and Roman Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: For requirements 3 and 4, up to 6 units (1.0 full-course equivalent) may be substituted from Philosophy 301 and 501 and History 319.

4.13.5 Minor in Greek and Roman Studies

The Minor in Greek and Roman Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete between 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in Greek and Roman Studies including:

1. 300-Level Courses: 18 units (3.0 full-course equivalents) labelled Greek and Roman Studies at the 300 level.

2. Upper-Level Courses: 6 units (1.0 full-course equivalent) from the Field of Greek and Roman Studies at the 400 or 500 levels.

3. Greek and Roman Studies Options: 6 units (1.0 full-course equivalent) at the 200 level or above from the Field of Greek and Roman Studies (inclusive of courses in Greek and Latin). Greek and Roman Studies 205 and 209 are recommended in first year.

4.13.6 Minor in Greek

The Minor in Greek is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete between at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Greek and Roman Studies, of which: (a) at least 18 units (3.0 full-course equivalents) must be labelled as Greek (GREK); and (b) at least 18 units (3.0 full-course equivalents) must be at the 300 level or above.

Note: The Minor in Greek is especially appropriate for students enrolled in Major programs such as English, French, History, Philosophy, and Religious Studies.

4.13.7 Minor in Latin

The Minor in Latin is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete between 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Greek and Roman Studies, of which: (a) at least 18 units (3.0 full-course equivalents) must be labelled as Latin (LATI); and (b) at least 18 units (3.0 full-course equivalents) must be at the 300 level or above.

Note: The Minor in Latin is especially appropriate for students enrolled in Major programs such as English, French, History, Philosophy, and Religious Studies.

4.13.8 BA in Religious Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Religious Studies while fulfilling the following requirements:

1. *Western and Eastern Religions:* 6 units (1.0 full-course equivalent) from the "Western Religions" Stream and 6 units (1.0 full-course equivalent) from the "Eastern Religions" Stream. (See note below.)
2. *Nature of Religion:* 6 units (1.0 full-course equivalent) from the "Nature of Religions" Stream including at least 3 units (0.5 full-course equivalent) from Religious Studies 437 or 447.
3. *Research Methods:* Religious Studies 377.
4. *Religious Studies Options*: 21 units (3.5 full-course equivalents) from the Field of Religious Studies.
5. Inclusive of the courses used in requirements 1 - 4 above, at least 36 units (6.0 full-course equivalents) must be at the senior level (300 and above) of which 12 units (2.0 full-course equivalents) must be at the 400 level or above.

C. OTHER REQUIREMENTS

Language Requirement: 6 units (1.0 full-course equivalent) in a language other than English.

D. DEGREE OPTIONS

The BA in Religious Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- The list of courses that fulfill the requirements for the "Eastern Religions" stream, the "Western Religions" stream and the "Nature of Religions" stream are located before the Religious Studies courses in the "Courses of Instruction" section of this calendar.
- Religious Studies 201 and 203 are recommended.
- Students are strongly advised to include in their programs relevant language courses (e.g., Classical Hebrew, Greek, Latin, Sanskrit, Tibetan, Chinese, Japanese, French, German) and relevant courses from other disciplines. Language courses labelled Religious Studies can be counted as part of the 42 units (7.0 full-course equivalents) in Religious Studies.
- In planning their programs, students should bear in mind that language courses and some senior courses are not offered every year.

4.13.9 BA Honours in Religious Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 and a maximum of 72 units (10-12 full-course equivalents) in the Field of Religious Studies while fulfilling the following requirements:

1. *Western and Eastern Religions:* 6 units (1.0 full-course equivalent) from the "Western Religions" Stream and 6 units (1.0 full-course equivalent) from the "Eastern Religions" Stream. (See note below.)
2. *Nature of Religion:* 6 units (1.0 full-course equivalent) from the "Nature of Religions" Stream including at least 3 units (0.5 full-course equivalent) from Religious Studies 437 or 447.
3. *Research Methods:* Religious Studies 377.
4. *Honours Thesis:* Religious Studies 590.
5. *Religious Studies Options*: 33 units (5.5 full-course equivalents) in the Field of Religious Studies.
6. Inclusive of the courses used in requirements 1-5 above, at least 42 units

(7.0 full-course equivalents) must be at the senior level (300 level and above) of which 18 units (3.0 full-course equivalents) must be at the 400 level or above.

C. OTHER REQUIREMENTS

Language Requirement: 6 units (1.0 full-course equivalent) in a language other than English.

D. DEGREE OPTIONS

The BA Honours in Religious Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- The lists of courses that fulfill the requirements for the "Eastern Religions" stream, the "Western Religions" stream and the "Nature of Religions" stream are located before the Religious Studies courses in the "Courses of Instruction" section of this calendar.
- Religious Studies 201 and 203 are recommended.
- By the beginning of a student's final year in the Honours program, a reading knowledge of a language other than English relevant to the topic of the Honours Thesis is normally required. Language courses labelled Religious Studies can be counted as part of the 60 units (10.0 full-course equivalents) in Religious Studies.
- The Honours Thesis is written in Religious Studies 590, usually during the final year of a student's program, under the close supervision of a member of the Department. At the end of the year, the student defends the thesis before a committee that consists of three faculty members, of which normally at least two are members of the Department.
- The Honours Thesis in suitable form is to be submitted by the first day of the final examinations scheduled by the Registrar in the Winter Term.
- In planning their programs, students should bear in mind that language courses and some senior courses are not offered every year.

4.13.10 Minor in Religious Studies

The Minor in Religious Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Religious Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above, including Religious Studies 377. In addition, in each of the three streams — Western Religions, Eastern Religions and Nature of Religion — there must be at least 6 units (1.0 full-course equivalent) (see note below).

Note: The lists of courses that fulfill the requirements for the "Eastern Religions" stream, the "Western Religions" stream and the "Nature of Religions" stream are located before the Religious Studies courses in the "Courses of Instruction" section of this calendar.

4.13.11 Concentration in Philosophy and Religion

Students completing a BA or BA Honours in Philosophy or Religious Studies can elect to complete a concentration in Philosophy and Religion. This option might be appropriate for students with an interest in the interdisciplinary study of philosophy and religion. The Concentration in Philosophy and Religion cannot be taken in conjunction with a combined or joint or double BA or BA Honours program in Philosophy and Religious Studies or a Major/Minor combination. Students must complete the following:

18 units (3.0 full-course equivalents) selected from:

- Philosophy 201, 331, 335, 527
- Religious Studies 345, 363, 444, 463
- Other senior-level Philosophy or Religious Studies courses may be accepted when the topic is appropriate. Obtaining approval from the Department of Classics and Religion will be required.

4.13.12 Minor/Concentration in South Asian Studies

The Concentration in South Asian Studies requires students to complete 18 units (3.0 full-course equivalents) in the field and is intended to recognize those students who choose to emphasize this important world area within their Major degree program.

The Minor in South Asian Studies requires students to complete 30 units (5.0 full-course equivalents) in the field, and is intended for students who may be considering graduate studies with a specialization in the field or careers where more extensive knowledge of South Asia would be advantageous. Students should contact the Program Coordinator as early as possible for advice on the program.

Requirements for the Minor

The Minor in South Asian Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) as follows:

1. South Asian Studies 203 and 531.
2. At least 24 units (4.0 full-course equivalents) from: Art History 323; History 404, 406; Religious Studies 203, 303, 307, 310, 312, 313, 317, 323, 327, 353, 451, 453; and South Asian Studies 303, 499.

Requirements for the Concentration

The Concentration requires the successful completion of 18 units (3.0 full-course equivalents) from the Minor in South Asian Studies, which is described above.

4.14 Communication, Media and Film Studies

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Communication and Media Studies

Bachelor of Arts (BA) in Communication and Media Studies

BA in Communication and Media Studies with Co-operative Education

BA Honours in Communication and Media Studies

BA Honours in Communication and Media Studies with Co-operative Education

Bachelor of Communication and Media Studies (BCMS)

Bachelor of Communication and Media Studies with Co-operative Education

Film Studies

Bachelor of Arts (BA) in Film Studies

BA in Film studies with Co-operative Education

BA Honours in Film Studies

BA Honours in Film Studies with Co-operative Education

Bachelor of Film Studies (BFS)

Bachelor of Film Studies (BFS) with Co-operative Education

Science, Technology and Society

Note: Admission to Science, Technology and Society programs have been suspended as of Fall 2015. Students in these programs should consult with an Arts program advisor to ensure completion of program requirements in a timely manner.

Bachelor of Arts (BA) in Science, Technology and Society

Bachelor of Science (BSc) in Science, Technology and Society

BA in Science, Technology and Society with Co-operative Education

BSc in Science, Technology and Society with Co-operative Education

BA Honours in Science, Technology and Society

BSc Honours in Science, Technology and Society

BA Honours in Science, Technology and Society with Co-operative Education

BSc Honours in Science, Technology and Society with Co-operative Education

Note: Minors are offered in: Communication and Media Studies; Film Studies; and Science, Technology and Society.

Introduction

The Department of Communication, Media and Film Studies hosts programs in Communication and Media Studies and Film Studies.

Communication and Media Studies explores the ways in which communication constructs and reflects society and culture. The program emphasizes three interrelated areas of communication: 1) Media and Pop-

ular Culture: the theory, criticism and history of communication through traditional media, new media and popular culture; 2) Rhetorical Communication: the theory, critique and production of informative, persuasive and professional discourse in public and organizational contexts; and 3) Science and Communication: discourses and processes of communication in relation to health, science and technology.

The program aims to educate flexible and articulate analysts, researchers and practitioners for a wide range of academic, public and professional contexts. It provides graduates with the knowledge, skill and discernment to communicate ideas effectively and to investigate communication in and across a variety of media including speech, writing, television, film, radio, digital media and interactive entertainment, the Internet, and wireless networks. Our co-operative education and experiential learning opportunities enable students to develop and apply their skills in non-academic contexts.

The Department offers a Bachelor of Arts (BA) in Communication and Media Studies and a Bachelor of Communication and Media Studies (BCMS). Opportunities for further concentration are available via the BA (Honours) in Communication and Media Studies. The BCMS is offered in partnership with SAIT Polytechnic and is intended for students who want the broad interdisciplinary base of knowledge provided by a university degree combined with practical skills in public relations, journalism, new media production, or radio, television, and broadcast news provided by a professional diploma program at SAIT or other approved program. A minor program is also offered. Degree requirements are outlined in 4.14.1 to 4.14.3.

Film Studies situates motion pictures within a wider culture of images and sounds, comprising both contemporary media and diverse historical practices. The program offers students the analytical skills and historical and theoretical frameworks to critically assess contemporary visual culture, and in this way helps to prepare them for careers in film and media criticism; film programming and production; work in cultural institutions; and university research and teaching.

The Department offers a Bachelor of Arts (BA) in Film Studies and a Bachelor of Film Studies (BFS). Students taking a BA in Film Studies will develop a broad understanding of the medium, considering film as an art form, as a cultural industry, and as an innovative and developing technology with social, cultural, and political significance. Opportunities for further concentration are available via the BA (Honours) in Film Studies program. The BFS is offered in partnership with SAIT Polytechnic and is intended for students who want the broad interdisciplinary base of knowledge provided by a university degree combined with the practical skills in film, video, and new media production. A minor program is also offered. Degree requirements are outlined in 4.14.4 to 4.14.6.

Note: Admission to Science, Technology and Society programs has been suspended as of Fall 2015. Students in these programs should consult with an Arts program advisor to ensure completion of program requirements in a timely manner.

The Science, Technology and Society program is designed to provide the student with an integrated understanding of the ways in which science and technology interact with the culture of any society, both as part of that culture and also as a force for change. This program will be useful for students seeking careers in a variety of fields, including communications, policy analysis, and strategic planning, and provides a solid foundation for further professional or graduate degrees.

Science, Technology and Society also provides an excellent opportunity for construction of a defined interdisciplinary component that may be of special interest to students in other faculties such as science, engineering, and business. The Director of Undergraduate Programs Co-ordinator for the Department of Communication, Media(,delete comma) and Film Studies is available to discuss specific student interests. Students may request to have Communication and Culture 507 (Collaborative Learning and Peer Mentoring) counted as a Science, Technology and Society option if they are mentoring in a course required by that program (including Communication and Culture 301, 303, 501 or 503). Such requests should be addressed to the Director of Undergraduate Programs Co-ordinator. Science, Technology and Society degree requirements are outlined in 4.14.7 and 4.14.8.

Contact Information

Department Office: Social Sciences 320

Phone: 403.220.6207

Fax: 403.210.8138

Email: ccapmail@ucalgary.ca

Website: commfilm.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Director of Undergraduate Programs in the Department of Communication, Media and Film Studies.

Admission to Major

Prospective students wishing to enter any of the degree programs offered by the Department of Communication, Media and Film Studies must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Limitation of Enrolment

When demand exceeds capacity, enrolment in the BA Communication and Media Studies will be restricted on a competitive basis.

Admission to Honours

The Faculty of Arts procedures for Admission to Honours established in section, 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework.

The deadline for submitting the Honours Program application form to the Department of Communication, Media and Film is February 1. Students taking Majors offered by the Department are eligible to apply for the Honours Program by the February 1 deadline only if they have completed at least 63 units (10.5 full-course equivalents).

Honours program applications to the department must include a preliminary Honours thesis proposal and the signature of a faculty member who has agreed to serve as the student's Honours thesis supervisor. Students are strongly advised to secure a supervisor by January 20. The Honours program application form is available at comcul.ucalgary.ca/forms.

Successful applicants to the Honours program will automatically be registered in Communication and Media Studies 590 or Film 590 (Honours Thesis) and will have their degree program changed. Further information is available on the department website. Students should also consult with the Honours Program Co-ordinator in the Department of Communication, Media and Film.

Overlapping Programs

The Bachelor of Communication and Media Studies and the Bachelor of Arts in Communication and Media Studies cannot be taken in conjunction with each other. The Bachelor of Film Studies and the Bachelor of Arts in Film Studies also may not be taken in conjunction with each other.

Degree Program Field Requirements

The **Field of Communication and Media Studies** consists of the following courses:

- All courses labelled Communication and Media Studies (COMS)
- All courses labelled Film Studies (FILM)
- All courses labelled Communication and Culture (CMCL)
- All courses labelled Science, Technology and Society (STAS)
- Anthropology 303
- Art History 419, 423
- Business Technology Management 321
- Canadian Studies 339, 341
- Development Studies 485
- English 387, 483, 523
- History 341, 495
- Human Resources and Organizational Dynamics 321
- Linguistics 223, 309
- Marketing 341
- Philosophy 275, 333, 361

- Political Science 431
- Psychology 203, 345
- Science 311
- Sociology 341, 345
- Urban Studies 313

Note: Most of the courses listed above have prerequisites that lie outside the Field of Communication and Media Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor to assist with a degree planning.

Field of Film Studies

Courses in the Field of Film Studies are grouped as follows:

Core Courses:

- Film 201, 321, 331, 333, 591

Courses on Film as Cultural Industry:

- Communication and Media Studies 435
- Film 407, 409, 441, 451, 461

Courses on the Aesthetics of Film:

- Art History 419, 423
- Canadian Studies 341
- Communication and Media Studies 371
- Chinese 357
- Film 203, 301, 305, 307, 323, 351, 403, 405, 409, 471
- Fine Arts 507
- French 343, 543
- German 357
- Spanish 573
- Urban Studies 313

Supporting Courses:

- Communication and Culture 501 and 503
- Communication and Media Studies 313 and 580
- Film Studies 590

Notes:

- Depending on the topic, Film 401 and 501 may be counted in the Film as a Cultural Industry category or the Aesthetics of Film category.
- Most of the courses listed above have prerequisites that lie outside the Field of Film Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor to assist with a degree planning.

Field of Science, Technology and Society

The Field of Science, Technology and Society consists of the following courses:

Courses with a Focus on Science, Technology and Society

- All courses labelled Science, Technology and Society (STAS)
- Anthropology 341
- Biology 307
- Communication and Media Studies 201
- Economics 373, 377, 379
- Geography 321
- Greek and Roman Studies 321
- History 354, 372, 493.38*, 493.39*, 541
- Innovation 321, 323
- Philosophy 367, 467, 517, 567
- Sociology 331, 333, 435
- *Applicable only when the content of the course is appropriate.

Supporting Courses:

- Communication and Culture 301, 303, 501, 503
- Communication and Media Studies 590

Note: Most of the courses listed above have prerequisites that lie outside the Field of Science, Technology and Society. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor to assist with a degree planning.

Courses in the Domain of Science for Science, Technology and Society

Courses from the "Domain of Science", for the Science, Technology and Society program, include the courses listed below:

- All courses offered by the Faculty of Science
- All courses offered by Schulich School of Engineering
- All courses labelled Earth Science EASC and Environmental Science ENSC
- Anthropology 201, 311, 404, 413, 435, 451, 505, 523, 552, 553, 571, 589
- Archaeology 201, 203, 306, 413, 415, 417, 437, 453, 471, 506, 515, 523, 533, 555, 589, 595, 596
- Geography 211, 231, 305, 307, 313, 333, 339, 357, 391, 392, 393, 403, 411, 413, 415, 417, 433, 437, 439, 457, 503, 519, 531, 533, 537, 567, 599
- Psychology 312, 407, 411, 469, 471, 473, 475, 477, 478, 479, 491, 497, 521, 531, 591

4.14.1 BA in Communication and Media Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS AND RECOMMENDED SEQUENCE

Students must successfully complete 48 units (8.0 full-course equivalents) to 60 units (10.0 full-course equivalents) in the Field of Communication and Media Studies and fulfill the following requirements:

1. *Core Courses*: 27 units (4.5 full-course equivalents): Communication and Media Studies 201, 203, 313, 369, 371, 381, 393, 591; Communication and Culture 301.
2. *Topics Courses*: 15 units (2.5 full-course equivalents) from courses labelled Communication and Media Studies or Film 451.
3. *Communication and Media Studies Options*: An additional 6 units (1.0 full-course equivalent) chosen from the Field of Communication and Media Studies.

Note: Communication and Media Studies (COMS) courses were formerly named Communications Studies (COMS). All are COMS courses and considered equivalent for prerequisite purposes.

C. DEGREE OPTIONS

The BA in Communication and Media Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.14.2 BA Honours Communication and Media Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete 60 units (10.0 full-course equivalents) to 72 units (12.0 full-course equivalents) in the Field of Communication and Media Studies and fulfill the following requirements:

1. Core Courses: 27 units (4.5 full-course equivalents): Communication and Media Studies 201, 203, 313, 369, 371, 381, 393, 591; Communication and Culture 301.
2. Topics Courses: 18 units (3.0 full-course equivalents) from courses labelled Communication and Media Studies or Film 451.
3. Communication and Media Studies Options: An additional 9 units (1.5 full-course equivalents) chosen from the Field of Communication and Media Studies.
4. Undergraduate Thesis: Communication and Media Studies 590.

Note: Communication and Media Studies (COMS) courses were formerly named Communications Studies (COMS). All are COMS courses and considered equivalent for prerequisite purposes.

C. DEGREE OPTIONS

The BA Honours in Communication and Media Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.14.3 Bachelor of Communication and Media Studies (BCMS)

The Bachelor of Communication and Media Studies degree is offered in partnership with SAIT Polytechnic or an equivalent approved program (see BCMS program requirements below for a list of approved diploma programs). The University of Calgary portion of the degree (72 units or 12.0 full-course equivalents) may be taken either before or after the diploma portion of the degree (48 units or 8.0 full-course equivalents).

Admission

Enrolment in the Bachelor of Communication and Media Studies program is limited. Students requesting admission to this program are assessed within the same pool

as those applying to the Bachelor of Arts degree in Communication and Media Studies.

When a student presents a SAIT or equivalent diploma for block transfer credit to the Bachelor of Communication and Media Studies degree, the grade point average for admission to the Communication and Media Studies program will be calculated over the entire diploma.

Note: Students must apply separately to an approved diploma program and meet all its admission requirements and application deadlines.

Requirements

A. FACULTY OF ARTS REQUIREMENTS

1. Overall Program: Successful completion of 120 units (20.0 full-courses equivalents) inclusive of 48 units (8.0 full-course equivalents) for an applicable diploma (see below).

2. Program Focus: Successful completion of the Communication and Media Studies Requirements and Other Requirements listed below.

3. Academic Achievement:

(a) A minimum GPA of 2.00 must be achieved over all courses.

(b) A maximum of 18 units (3.0 full-course equivalent) "D" or "D+" grades overall.

(c) A maximum of 6 units (1.0 full-course equivalent) "D" or "D+" grades in the major field.

4. University of Calgary Study: A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree inclusive of the 48 units (8.0 full-course equivalents) for an applicable diploma (see below).

5. Depth: A maximum of 54 units (9.0 full-course equivalents) at the junior or 200 level (including the 24 units (4.0 full-course equivalents) of junior transfer credit received as part of the diploma).

6. Breadth: A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science.

7. Physical Activity Courses: A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

B. COMMUNICATION AND MEDIA STUDIES REQUIREMENTS

1. Core Courses: 27 units (4.5 full-course equivalents) consisting of Communication and Media Studies 201, 313, 369, 371, 381, 580, Communication and Culture 301 and one of Communication and Media Studies 203 or 393.

2. Topics Course: an additional 9 units (1.5 full-course equivalents) from courses labelled Communication and Media Studies, 3 units (0.5 full-course equivalent) of which must be at the 400 level or above.

C. OTHER REQUIREMENT

Applicable Diploma: Completion of one of the following two-year diploma programs, or an approved equivalent, with a grade point average of 2.00 on all courses. No more than 9 units (1.5 full-course equivalents) may have a "D" or "D+".

- SAIT Polytechnic: Journalism; Cinema, Television, Stage and Radio; New Media Production and Design; Radio, Television and Broadcast News; Film and Video Production; Graphic Communications and Print Technology
- NAIT: Radio and Television Arts; Digital Media and IT
- Lethbridge College: Communication Arts: Print Journalism; Broadcast Journalism; Advertising and Public Relations
- Grant MacEwan University: Design Studies
- Mount Royal University: Broadcasting
- Algonquin College: Broadcasting; Journalism; Professional Writing
- BCIT: Broadcast and Media Communications
- Douglas College: Professional Writing
- Sheridan College: Print/Broadcast Journalism
- Memorial University: Professional Writing; Performance and Communications Media
- Confederation College: Broadcasting - Television Production; Film Production

D. DEGREE OPTIONS

The Bachelor of Communication and Media Studies can be taken with Co-operative Education but students may face sequencing constraints and/or require extra time to complete their programs. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students must apply separately to the post-secondary institution offering the diploma and meet all its admission requirements and application deadlines. Students who are unsuccessful in applying to the post-secondary institution offering the diploma may transfer to the four-year Bachelor of Arts in Communication and Media Studies at the University of Calgary, or any other University of Calgary program for which they qualify. Courses already completed toward the Bachelor of Communication and Media Studies may be applied toward the Bachelor of Arts in Communication and Media Studies.
- Students should enrol in Communication and Media Studies 201, 313, 369, 371, 381 and Communication and Culture 301 as early as possible in their program of study.

4.14.4 Minor in Communication and Media Studies

The Minor in Communication and Media Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Communication and Media Studies. The Communication and Media Studies Minor also requires:

1. *Core Courses*: 12 units (2.0 full-course equivalents) from Communication and Media Studies 201, 203, 371, 381, 393 and either Communication and Media Studies 363 or 369.
2. *Topics Courses*: An additional 6 units (1.0 full-course equivalent) from courses labelled Communication and Media Studies at the 400 level or above or Film 451.
3. *Communication and Culture Options*: An additional 12 units (2.0 full-course equivalents) from additional courses labelled Communication and Media Studies or Film Studies.

4.14.5 BA in Film Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Film Studies while fulfilling the following requirements:

1. Core Courses: 12 units (2.0 full-course equivalents) as follows:

a. 9 units (1.5 full-course equivalents) from Film 201, 321 and 591;

b. 3 units (0.5 full-course equivalent) from Film 331 or 333.

2. Film as Cultural Industry: 6 units (1.0 full-course equivalent) from “Courses on Film as a Cultural Industry” within the Field of Film.

3. Aesthetics of Film: 9 units (1.5 full-course equivalents) from “Courses on the Aesthetics of Film” within the Field of Film.

4. Film Options: 21 units (3.5 full-course equivalents) from courses labelled Film.

C. DEGREE OPTIONS

The BA in Film Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: Some of the courses listed above in categories 2 and 3 have prerequisites. It is the student's responsibility to ensure that these prerequisites are completed.

4.14.6 BA Honours Film Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Film Studies while fulfilling the following requirements:

1. *Core Courses*: 12 units (2.0 full-course equivalents) as follows:

a. 9 units (1.5 full-course equivalents) from Film 201, 321 and 591;

b. 3 units (0.5 full-course equivalent) from Film 331 or 333.

2. *Film as Cultural Industry*: 6 units (1.0 full-course equivalent) from "Courses on Film as a Cultural Industry" within the Field of Film.

3. *Aesthetics of Film*: 9 units (1.5 full-course equivalents) from "Courses on the Aesthetics of Film" within the Field of Film.

4. *Film Options*: 21 units (3.5 full-course equivalents) from courses labelled Film.

5. *Undergraduate Thesis*: Film 590.

C. DEGREE OPTIONS

The Honours BA in Film Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: Some of the courses listed above in categories 2 and 3 have prerequisites. It is the student's responsibility to ensure that these prerequisites are completed.

4.14.7 Bachelor of Film Studies (BFS)

The Bachelor of Film Studies degree is offered in partnership with SAIT Polytechnic. The University of Calgary portion of the degree (72 units or 12.0 full-course equivalents) may be taken either before or after the SAIT portion of the degree (48 units or 8.0 full-course equivalents).

Admission

Enrolment in the Bachelor of Film Studies program is limited. Students requesting admission to this program are assessed within the same pool as those applying to the Bachelor of Arts degree in Film Studies. When a student presents a SAIT or equivalent diploma for block transfer credit to the Bachelor of Film Studies degree, the grade point average for admission to the Film Studies program will be calculated over the entire diploma.

Note: Students must apply separately to SAIT Polytechnic and meet all its admission requirements and application deadlines.

Requirements

A. FACULTY OF ARTS REQUIREMENTS

1. Overall Program: Successful completion of 120 units (20.0 full-course equivalents) inclusive of 48 units (8.0 full-course equivalents) for an applicable diploma (see below).

2. Program Focus: Successful completion of the Film Studies Requirements and the Other Requirements listed below.

3. Academic Achievement:

(a) A minimum GPA of 2.00 must be achieved over all courses.

(b) A maximum of 18 units (3.0 full-course equivalents) "D" or "D+" grades overall.

(c) A maximum of 6 units (1.0 full-course equivalent) "D" or "D+" grades in the major field.

4. University of Calgary Study: A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree inclusive of the 48 units (8.0 full-course equivalents) for an applicable diploma (see below).

5. Depth: A maximum of 54 units (9.0 full-course equivalents) at the junior or 200 level (including the 24 units (4.0 full-course equivalents) of junior transfer credit received as part of the diploma).

6. Breadth: A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science.

7. Physical Activity Courses: A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

B. FILM STUDIES REQUIREMENTS

1. Core Courses: 18 units (3.0 full-course equivalents) as follows:

(a) 15 units (2.5 full-course equivalents) from Film 201, 321; Communication and Media Studies 313 and 580.

(b) 3 units (0.5 full-course equivalent) from either Film 331 or 333.

2. Topics Courses: 18 units (3.0 full-course equivalents) from courses labelled Film.

C. OTHER REQUIREMENT

Applicable Diploma: Completion of the SAIT Film and Video Production diploma program, or approved equivalent, with a grade point average of 2.00 on all courses. No more than 9 units (1.5 full-course equivalents) may have a grade of "D" or "D+."

D. DEGREE OPTIONS

The Bachelor of Film Studies can be taken with Co-operative Education but students may face sequencing constraints and require extra time to complete their programs. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: Students must apply separately to SAIT and meet all its admission requirements and application deadlines. Students who are unsuccessful in applying to SAIT may transfer to the four-year Bachelor of Arts in Film Studies at the University of Calgary, or to any other University of Calgary program for which they qualify. Courses already completed toward the Bachelor of Film Studies (BFS) may be applied toward the Bachelor of Arts in Film Studies.

4.14.8 Minor in Film Studies

The Minor in Film Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Film Studies. The Film Studies Minor also requires:

1. 6 units (1.0 full-course equivalent) from Film 201 and 321.
2. 3 units (0.5 full-course equivalent) from either Film 331 or 333.
3. An additional 15 units (2.5 full-course equivalents) from courses labelled Film of which 6 units (1.0 full-course equivalent) must be at the 400 or 500 level.
4. An additional 6 units (1.0 full-course equivalent) from within the Field of Film Studies excluding Communication and Culture 501 and 503.

4.14.9 BA or BSc in Science, Technology and Society

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

If a student accumulates 42 units (7.0 full-course equivalents) or more in the Domain of Science (see 4.14.11) in fulfilling the Faculty and Major-Field Requirements listed below, the degree will be awarded as a BSc. Otherwise the degree will be awarded as a BA.

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Science, Technology and Society while fulfilling the following requirements:

- *Core Courses*: 33 units (5.5 full-course equivalents) from Science, Technology and Society 201, 325, 327, 341, 343 and 591; Philosophy 367; Communication and Culture 301, 303, 501, 503.
- *History of Science*: 3 units (0.5 full-course equivalent) from History 354, 372, 493.38*, 493.39* or 541. Additional courses may be used to satisfy the History of Science requirement. Please consult with the Department.
- *Science, Technology and Society Options*: an additional 12 units (2.0 full-course equivalents) chosen from the Field of Science, Technology and Society. (Additional courses from the Faculty of Science approved by the Department.)

**Will be accepted when the topic is appropriate.*

C. OTHER REQUIREMENTS

Science Requirement: 3 units (0.5 full-course equivalent) at the 400 level from the Faculty of Science or from Faculty of Arts courses within the "Domain of Science" along with any relevant prerequisites.

D. DEGREE OPTIONS

The Bachelor of Arts in Science, Technology and Society can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: Science, Technology and Society 201 is recommended in first year.

4.14.10 BA or BSc Honours Science, Technology and Society

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

If a student accumulates 42 units (7.0 full-course equivalents) or more in the Domain of Science (see 4.14.11) in fulfilling the Faculty and Major-Field Requirements listed below, the degree will be awarded as a BSc. Otherwise the degree will be awarded as a BA.

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course

equivalents) in the Field of Science, Technology and Society while fulfilling the following requirements:

1. *Core Courses*: 33 units (5.5 full-course equivalents) from Science, Technology and Society 201, 325, 327, 341, 343 and 591; Philosophy 367; Communication and Culture 301, 303, 501, 503.
2. *History of Science*: 3 units (0.5 full-course equivalent) from History 354, 372, 493.38*, 493.39* or 541. Additional courses may be used to satisfy the History of Science requirement. Please consult with the Department.
3. *Science, Technology and Society Options*: an additional 12 units (2.0 full-course equivalents) chosen from the Field of Science, Technology and Society. (Additional courses from the Faculty of Science approved by the Department.)
4. *Undergraduate Thesis*: Communication and Media Studies 590.

**Will be accepted when the topic is appropriate.*

C. OTHER REQUIREMENTS

Science Requirement: 3 units (0.5 full-course equivalent) at the 400 level from the Faculty of Science or from Faculty of Arts courses within the "Domain of Science" along with any relevant prerequisites.

D. DEGREE OPTIONS

The BA Honours in Science, Technology and Society can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.14.11 Minor in Science, Technology and Society

The Minor in Science, Technology and Society is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Science, Technology and Society with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The Science, Technology and Society Minor also requires:

1. 9 units (1.5 full-course equivalents) from Science, Technology and Society 325 or 327, 591, Philosophy 367.
2. 3 units (0.5 full-course equivalent) from History 354, 372, 493.38*, 493.39* or 541.
3. 9 units (1.5 full-course equivalents) from Science, Technology and Society 201, 325 or 327 (if not used to satisfy item 1. above) 341, 343, 401, 421, 501, 505.
4. An additional 9 units (1.5 full-course equivalents) from the list of "Courses with a Focus on Science, Technology and Society" within the Field of Science, Technology and Society.

**Will be accepted when the topic is appropriate.*

4.15 Communications Studies

See Communication, Media and Film Studies.

4.16 Comparative Literature

Overview of Programs and Procedures

Note: Applications to this program are currently suspended.

The Faculty of Arts offers a Minor Field of specialization in Comparative Literature. Students intending to pursue this Minor should consult with the Program Director for selection of the courses appropriate to the Minor and to their interest and background.

Contact Information and Program Advice

For overall program advice, please speak to a program advisor in the Faculty of Arts Students' Centre. Questions about program details should be addressed to the subject advisor in the Departmental Office; please see the Department website for contact information.

Field of Comparative Literature

The Field of Comparative Literature consists of the following courses:

- All courses labelled Comparative Literature (COLT)
- English 517
- French 511
- Philosophy 315

Notes:

- Most of the courses listed above have prerequisites, many of which lie outside the Field of Comparative Literature. It is the student's responsibility to ensure that prerequisites are completed.
- Additional courses in the Field may be listed on the Faculty of Arts website.

4.16.1 Minor in Comparative Literature

The Minor in Comparative Literature is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) with at least 18 units (3.0 full-course equivalents) at the 300 level or above. In addition, the following specific requirements must be met:

1. *Introductory Courses:* Comparative Literature 201 and 203 (to be completed as early as possible).

2. *Supporting Courses: 12* units (1.0 full-course equivalent) from: Comparative Literature 405, 517; English 517; French 511; Philosophy 315.

3. *Comparative Literature Options:* A minimum of 18 units (3.0 full-course equivalents) in Comparative Literature. Literature courses from various Departments may be substituted for Comparative Literature courses with the approval of the Associate Dean (Undergraduate Programs and Student Affairs).

4. *Language Requirement:* In addition to English, reading competence is required in another language. This requirement may be met by course work in an ancient or a modern language appropriate to the student's program or by examination. Language competence is required at a level equivalent to the completion of 12 units (1.0 full-course equivalent) at the 300 level or above in the language in question.

Notes:

- Some of the courses relevant to the Minor have prerequisites.
- Courses used to fulfill the requirements of the Minor may not be used to fulfill requirements for a Major.

4.17 Creative Writing

See English.

4.18 Dance

See School of Creative and Performing Arts.

4.19 Development Studies

See Anthropology and Archaeology.

4.20 Drama

See School of Creative and Performing Arts.

4.21 Earth Science

See Geography.

4.22 East Asian Language Studies

See Linguistics, Languages, and Culture.

4.23 East Asian Studies

See Linguistics, Languages, and Culture.

4.24 Economics

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Economics

BA in Economics with Co-operative Education

BA Honours in Economics

BA Honours in Economics with Co-operative Education

Notes:

- A Minor is offered in Economics.
- A Minor and a Concentration are offered in Applied Energy Economics

Introduction

The Department of Economics offers instruction in the Field of Economics. The BA Honours program is recommended for students planning to pursue a graduate degree in economics and for those who seek an enriched understanding of the subject at the undergraduate level.

Students are urged to consult regularly with the Economics Advisor and/or designated Faculty members concerning the selection of their courses. Many 300-level courses have an Economics 201 and 203 (or consent of the Department) prerequisites and some have Mathematics or Statistics courses as prerequisites. Economics 301, 303, 357, 359, 387, 389 and 395 are prerequisites for

many 400- and 500-level courses, especially those in the Honours program.

Contact Information

Department Office: Social Sciences 454

Phone: 403.220.5857

Fax: 403.282.5262

Email: econ@ucalgary.ca

Website: econ.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the Department of Economics (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Economics) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Limitation of Enrolment

Due to high demand, admission to the Economics Major is limited. Whenever demand exceeds capacity, enrolment will be limited and students will be admitted on a competitive basis. Admission averages are typically set above the minimum level for the Faculty of Arts. These higher admission standards are applicable to high-school applicants, external transfer applicants from other post-secondary institutions and internal transfer applicants from other programs at the University of Calgary, whether inside or outside the Faculty of Arts.

Admission to Honours

The Faculty of Arts procedures for "Admission to Honours" established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. The application deadline is February 1.

Field of Economics

The Field of Economics consists of all courses labelled Economics (ECON).

4.24.1 BA in Economics

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Economics while fulfilling the following requirements:

1. *Core:* 21 units (3.5 full-course equivalents) from Economics 201, 203, 301, 303, 357, 359 and 395.

2. *Upper-Level Courses:* 12 units (2.0 full-course equivalents) from the 400- or 500-level, which have one of Economics 301, 303, 357 or 359 as a prerequisite.

3. *Economics Options:* An additional 9 units (1.5 full-course equivalents) in Economics.

C. OTHER REQUIREMENTS

1. *Mathematics Requirement:* Mathematics 249 or 265.

2. *Statistics Requirement:* Statistics 205 or 213 or the equivalent.

D. DEGREE OPTIONS

- The BA in Economics can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.
- The BA Honours in Economics can be taken with a "Concentration in Applied Energy Economics" (see Section 4.24.4).

Notes:

- Students are advised to complete Economics 357 and 395 early in their programs of study because these courses are prerequisites for many 400- and 500-level Economics courses.
- For other program advice students are encouraged to consult the Explicit Syllabus of the Department of Economics at econ.ucalgary.ca/undergraduate/explicit-syllabus.

4.24.2 BA Honours in Economics

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Economics while fulfilling the following requirements:

1. *Core:* 21 units (3.5 full-course equivalents) from Economics 201, 203, 301, 303, 357, 359 and 395.

2. *Capstone:* Economics 387, 389, 495, 497, 557 and 559.

3. *Upper-Level Courses:* 9 units (1.5 additional full-course equivalents) from the 400- or 500-level, which have one of Economics 301, 303, 357 or 359 as a prerequisite.

4. *Economics Options:* An additional 12 units (2.0 full-course equivalents) in Economics.

C. OTHER REQUIREMENTS

1. *Mathematics Requirement:* (a) Mathematics 211 or 213; and (b) Mathematics 249 or 265.

2. *Statistics Requirement:* Statistics 205 or 213 or the equivalent.

D. DEGREE OPTIONS

- The BA Honours in Economics can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.
- The BA Honours in Economics can be taken with a "Concentration in Applied Energy Economics" (see Section 4.24.4).

Notes:

- If a student has an acceptable Minor Field or a concentration of at least 18 units (3.0 full-course equivalents), the Undergraduate Director may reduce the number of courses in Economics required for Honours below 60 units (10.0 full-course equivalents). In all cases, the student must have at least 48 units (8.0 full-course equivalents) and meet Requirements 1-3.
- Students are advised to take Math 211, Economics 357 and 395 early in their programs of study because these courses are prerequisites for many 400- and 500- level economics courses.
- For program advice on recommended courses outside the Department, consult the Explicit Syllabus of the Department of Economics at econ.ucalgary.ca/undergraduate/explicit-syllabus.

4.24.3 Minor in Economics

The Minor in Economics is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Economics with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.24.4 Minor and Concentration in Applied Energy Economics

Minor in Applied Energy Economics (available to non-Economics Majors)

Concentration in Applied Energy Economics (available to Economics Majors)

Note: Applied Energy Economics is not offered as a Major Field of study.

Introduction

The Faculty of Arts offers the Applied Energy Economics program. The Program provides the historical and institutional background and the basic tools necessary for an understanding of the operation of North American and world energy markets. The program includes the development of analytical and problem-solving skills. Students will benefit from expert instruction by academics at the University.

While it is anticipated that students who graduate with a Minor or Concentration in applied energy economics will enhance their prospects of securing relevant and rewarding employment in the energy sector, additional education and training is recommended for those wishing to take full advantage of the career opportunities in applied energy economics. This typically involves the completion of a master's degree. Students contemplating graduate work should consult the Department of Economics in the selection of courses.

There are two Applied Energy Economics programs. For the non-Economics major there is a Minor in Applied Energy Economics. For the Economics Major there is a Concentration in Applied Energy Economics. The Minor or Concentration in Applied

Energy Economics Concentration will be recorded on a student's transcript of record.

Admission

Applications for admission to the program (either the Minor or Concentration in Applied Energy Economics) can be made to the Faculty of Arts. Prior to applying for admission, students must have completed Economics 201 and 203. Admission to the program may have to be limited. If applications exceed spaces, students will be admitted in order of descending GPA.

For additional information, see the Economics Advisor. For additional information about programs and the Department, visit econ.ucalgary.ca.

Requirements for the Minor in Applied Energy Economics

This Minor, which is available only to students with Major Fields other than Economics, requires the successful completion of a minimum of 30 units (5.0 full-course equivalents) and a maximum of 36 units (6.0 full-course equivalents) from the Field of Economics as follows:

Required Courses: Economics 201, 203, 301, 357, 395 and 493.

Applied Energy Economics Options: 12 units (2.0 full-course equivalents) from: Economics 323, 325, 327, 329, 377, 475, 477, 487, 527.

Note: Versions of the decimalized courses Economics 399, 499 and 599, which are designated by the Department of Economics, may be used toward the requirement for Applied Energy Economics options.

Requirements for the Concentration in Applied Energy Economics

This Concentration is available only to students pursuing a Degree in Economics. In addition to the requirements for the BA or Honours BA in Economics, students must meet the additional following requirements:

Required Courses: Economics 427, 493.

Applied Energy Economics Options: 18 units (3.0 full-course equivalents) from: Economics 323, 325, 327, 329, 377, 453, 475, 477, 487, 495, 527.

Notes:

- Students may count the courses used to satisfy the requirements of the concentration toward either the BA or BA Honours in Economics. Depending on the choice of courses for the concentration, students may or may not be able to complete the BA or BA Honours in Economics with the minimum number of courses.
- Students may be able to take additional "Applied Energy Economics Options" subject to the constraint that those in the BA in Economics are only permitted to take a maximum of 60 units (10.0 full-course equivalents) from the Field of Economics in total while those in the BA Honours in Economics are only permitted to take a maximum of 72 units (12.0 full-course equivalents).
- Students should choose their courses and course sequence in consultation with the Department of Economics. This is particularly important for students who are combining the Concentration in Applied Energy Economics with BA Honours, Co-operative Education, or Combined Degree programs.
- Versions of the decimalized courses Economics 399, 499 and 599, which are designated by the Department of Economics, may be used toward the requirement for Applied Energy Economics options.

4.25 English

Overview of Programs and Procedures in English

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in English

BA in English with Co-operative Education

BA Honours in English

BA Honours in English with Co-operative Education

Concurrent BA in English/Bachelor of Education

Note:

- A Minor is offered in English.
- A Creative Writing Concentration is offered.

Introduction

Students choosing to major in English may choose to complete either a BA in English or an Honours BA in English. Both are four-year programs. Minors, Majors and Honours students in English must complete the Foundation Program, consisting of English 203, 205, 302 and 340.

The prerequisite for 300-level English courses is normally 6 units (1.0 full-course equivalent) of English and/or Comparative Literature at the 200 level. Completion of the senior courses of the Foundation Program (English 302 and 340) is the standard prerequisite for 400-level courses. A student who has not completed English 302 and 340 may be admitted to a 400- or 500-level course only if the Department judges the student's level of literary or other preparation sufficient for the demands of the course.

The Department of English offers a Concentration in Creative Writing for both English Majors and undergraduate students in other programs.

Notes:

- Students wanting to leave open the option of proceeding to graduate study in English should be aware that the Honours degree is felt by the Department to constitute the best preparation for such study.
- Students with credit in English 240 may complete the Foundation Program under the regulations in the 2008-09 Calendar.
- Students who declared an English Major prior to 2009-2010 should consult the Department on appropriate course selection.
- The following 300-level courses have no prerequisites: English 311, 317, 351, 353, 355, 371, 372, 382, 383, 384, 385, 387, 388, 389, 391, 393, 395, 396, 399.
- Not every course at the 300 level and above will necessarily be offered every year. Current course offerings, including the specific topics to be taught in 500-level topics courses, are listed in the Schedule of Classes, and more detailed information is available from the Department website.

Contact Information

Department Office: Social Sciences 1152

Phone: 403.220.5470

Fax: 403.289.1123

Email: engladv@ucalgary.ca

Website: english.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (English) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

The Faculty of Arts procedures for "Admission to Honours" established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. The application deadline is February 1.

Field of English

Courses in the Field of English are grouped as follows:

Foundation Courses:

- English 203, 205, 302, 340

Canadian Literature Courses:

- English 371, 372, 471, 473, 509

Post-Colonial Studies Courses:

- English 385, 391, 490, 491, 493 and 515

Historical Courses:

- English 401, 403, 405, 406, 409, 410, 411, 412, 413, 431, 433, 435, 441, 443, 445, 447, 449, 461

Other Courses in the Field of English:

- All other courses labelled English (ENGL)
- Drama 371, 471, 572*
- Linguistics 321, 435

Notes:

- Courses marked with an asterisk (*) can be counted in the Field of English when the topic is appropriate. Please consult with the Department.

- English Composition ENCO courses do not count towards the Major Field in English.

4.25.1 BA in English

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of English while fulfilling the following requirements:

1. *Foundation Program:* English 203, 205, 302 and 340.

2. *Canadian Literature:* 3 units (0.5 full-course equivalent) chosen from "Canadian Literature Courses" within the Field of English.

3. *Postcolonial Studies:* 3 units (0.5 full-course equivalent) chosen from "Postcolonial Studies" within the Field of English.

4. Historical Courses: 12 units (2.0 full-course equivalents) consisting of the following:

(a) 3 units (0.5 full-course equivalent) from: English 401, 403, 405, or 406

(b) 3 units (0.5 full-course equivalent) from: English 409, 410, 411, 412 or 413

(c) 3 units (0.5 full-course equivalent) from: English 431, 433, or 435

(d) 3 units (0.5 full-course equivalent) from: English 441, 443, 445, 447, 449, or 461

5. *English Options:* An additional 12 units (2.0 full-course equivalents) at the 300 level or above from the Field of English, including at least 6 units (1.0 full-course equivalent) labelled English.

6. *Upper-Year Courses:* Inclusive of the courses used to satisfy requirements 2-5 above, 21 units (3.5 full-course equivalents) must be from courses labelled English at the 400 level or above, of which at least 3 units (0.5 full-course equivalent) must be at the 500 level.

D. DEGREE OPTIONS

The BA in English can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- English 201 or the equivalent can be used as a substitute for English 203 in the foundation program to facilitate transfers or late entries into the BA programs in English. Please consult with the Department concerning preparation for further study.
- Students in second year or above who do not already hold credit for English 205 may use English 311 as an alternative Shakespeare Course in the Foundation Program.
- Up to 6 units (1.0 full-course equivalent) selected from the following list may be counted towards the major field: Drama 371, 471, Linguistics 321, 435. Students may consult with the department to verify whether additional pertinent courses outside of the field may be applied to the major program.
- In exceptional circumstances, other courses may be accepted by the Department in lieu of part or all of the Foundation Program, particularly in the case of students transferring from other institutions.
- With Department consent, students transferring from other institutions may satisfy part or all of the Historical course requirements with transfer courses focusing on the appropriate periods. Students must supply detailed course outlines for each proposed transfer course, in order for such equivalency to be considered.
- English Majors should note that competency in a second language is often required for advanced studies in the field.

4.25.2 BA Honours English

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of English while fulfilling the following requirements:

1. *Foundation Program:* English 203, 205, 302 and 340.

2. *Canadian Literature:* 3 units (0.5 full-course equivalent) must be chosen from "Canadian Literature Courses" within the Field of English.

3. *Postcolonial Studies:* 3 units (0.5 full-course equivalent) must be chosen from "Postcolonial Studies Courses" within the Field of English.

4. *Historical Courses:* 12 units (2.0 full-course equivalents) consisting of the following:

(a) 3 units (0.5 full-course equivalent) from: English 401, 403, 405, or 406

(b) 3 units (0.5 full-course equivalent) from: English 409, 410, 411, 412, or 413

(c) 3 units (0.5 full-course equivalent) from: English 431, 433, or 435

(d) 3 units (0.5 full-course equivalent) from: English 441, 443, 445, 447, 449, or 461

5. *Honours Project:* English 504 (Students must consult with the English Department for information and advice by January 31 of the calendar year in which they plan to register in English 504.)

6. *English Options:* An additional 18 units (3.0 full-course equivalents) at the 300 level or above from the Field of English, including at least 12 units (2.0 full-course equivalents) labelled English.

7. *Upper-Year Courses:* Inclusive of the courses used to satisfy requirements 2-6 above, 24 units (4.0 full-course equivalents) must be from courses labelled English at the 400 level or above, of which at least 12 units (2.0 full-course equivalents) must be at the 500 level.

D. DEGREE OPTIONS

The BA Honours in English can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- English 201 or the equivalent can be used as a substitute for English 203 in the foundation program to facilitate transfers or late entries into the BA programs in English. Please consult with the Department concerning preparation for further study.
- Students in second year or above who do not already hold credit for English 205 may use English 311 as an alternative Shakespeare Course in the Foundation Program.
- Up to 6 units (1.0 full-course equivalent) selected from the following list may be counted towards the major field: Drama 371, 471, Linguistics 321, 435. Students may consult with the department to verify whether additional pertinent courses outside of the field may be applied to the major or honours program.
- In exceptional circumstances, other courses may be accepted by the Department in lieu of part or all of the Foundation Program, particularly in the case of students transferring from other institutions.
- With Department consent, students transferring from other institutions may satisfy part or all of the Historical course requirements with transfer courses focusing on the appropriate periods. Students must supply detailed course outlines for each proposed transfer course, in order for such equivalency to be considered.
- Students should consult with the English Advisor concerning an appropriate choice of courses to ensure an appropriate sequence and adequate breadth.
- English Honours students should note that competency in a second language is often required for advanced studies in the field.

4.25.3 Minor in English

The Minor in English is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of English, including at least 18 units (3.0 full-course equivalents) labelled English at the 300 level and above. Inclusive of the regulations above, all English Minors must take either English 205 or 311, English 302 and English 340.

Note: The department strongly encourages all English Minors, particularly those planning to enter the teaching profession, to

take at least one course at the 400 level or above.

4.25.4 Creative Writing Concentration

The Concentration in Creative Writing is open to both English Majors and undergraduate students in other programs. The Concentration requires the successful completion of at least 18 units (3.0 full-course equivalents) from:

- English 364, 366, 494, 496, 593, 594, 595, 598
- Drama 371, 471

All University of Calgary students are eligible to apply to take Creative Writing courses. Admission into these courses is selective and is based on the submission of a portfolio to be submitted by each prospective student. The designation "Creative Writing Concentration" will appear on the transcripts of students who complete the required program and request this designation from the Arts Students' Centre.

Note: For English Honours students, 6 units (1.0 full-course equivalent) in creative writing may be met by taking English 504 with a creative writing project.

4.26 Film Studies

See Communication, Media and Film Studies.

4.27 French

See French, Italian and Spanish.

4.28 French, Italian and Spanish

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Degrees in French

Bachelor of Arts (BA) in French

BA in French with Co-operative Education

BA Honours French

BA Honours French with Co-operative Education

Degrees in Italian Studies

BA in Italian Studies

BA in Italian Studies with Co-operative Education

Degrees in Spanish

BA in Spanish

BA in Spanish with Co-operative Education

BA Honours Spanish

BA Honours Spanish with Co-operative Education

Other Degrees

BA in French and Italian

BA in French and Italian with Co-operative Education

BA in French and Spanish

BA in French and Spanish with Co-operative Education

BA in Italian and Spanish

BA in Italian and Spanish with Co-operative Education

Concurrent BA in French/Bachelor of Education

Concurrent BA in Spanish/Bachelor of Education

Related Interdisciplinary Degrees (See separate listings)

BA in Latin American Studies

Note: Minors are offered in French, Italian and Spanish.

Introduction

The Department of French, Italian and Spanish offers instruction in the fields of French, Italian and Spanish together with courses bearing the title Romance Studies. (The latter courses do not constitute a Major Field of study.)

Advanced Placement and Credit by Special Assessment

French, Italian and Spanish-speaking students or students with more than high-school matriculation in these languages (including graduates of a bilingual or immersion program) must consult the Department to be placed in a course corresponding to their level of linguistic competence.

Students seeking credit by special assessment should consult the Department regarding courses available for credit in this manner. Native speakers are not eligible to take language courses by special assessment or to receive advanced credit for them.

Study Abroad

Noting that the advancement of knowledge and understanding is a global enterprise, the Mission Statement of the University of Calgary strongly advocates international contacts among staff and students. In this context, the Department of French, Italian and Spanish encourages its students to take advantage of possibilities for studying off-campus, wherever one of its target languages is spoken. Detailed information on courses and programs in French (in Quebec or elsewhere), Italian and Spanish is available from the Department and/or the Centre for International Students and Study Abroad.

Students planning to study off-campus must obtain a letter of permission from their faculty. They are strongly advised to consult the Department of French, Italian and Spanish beforehand to discuss details concerning course selection and transfer of credit.

Programme menant au certificat de langue française/Certificate Program in French Language Studies

En collaboration avec l'Education permanente et le Centre français, le Département de français, italien et espagnol offre un programme menant au certificat de langue française. Ce programme réunit des cours avec crédit, des cours sans crédit et des activités culturelles. Pour de plus amples renseignements, prière de s'adresser au Centre français, 403.220.7226, ucalgary.ca/frenchcentre/.

In collaboration with Continuing Education and the French Centre, the Department of French, Italian and Spanish offers a Certificate Program in French Language Studies combining credit and non-credit courses with participation in cultural activities. Complete information may be obtained from the French Centre at 403.220.7226 or ucalgary.ca/frenchcentre/.

Le Centre français/The French Centre

Le Département de français, italien et espagnol travaille de près avec le Centre français qui fait partie de l'Education permanente. Situé à Craigie Hall (C 301), le Centre propose un choix de cours sans crédit et d'activités culturelles, administre le programme menant au certificat de langue française et gère "Le francofonne," lieu de rencontre et centre multimédia où l'on peut se détendre dans une ambiance francophone. Le Centre gère aussi des cours accrédités donnés en français dans différentes disciplines (French Language Instruction Program ou FLIP) permettant à l'étudiant de renforcer sa maîtrise de la langue. Pour de plus amples renseignements, prière de s'adresser au Centre français, 403.220.7226, ucalgary.ca/frenchcentre/.

The Department of French, Italian and Spanish maintains close links with the French Centre, a facility operated by Continuing Education. Located in Craigie Hall (C 301), the Centre offers a variety of non-degree courses and cultural activities, administers the Certificate Program in French Language Studies, and operates "Le francofonne," a drop-in and media learning centre for those wishing to relax in a francophone atmosphere. Through the French Language Instruction Program (FLIP), credit courses are offered in other departments providing students with another opportunity to perfect their French. Detailed information may be obtained from the Centre at 403.220.7226 or ucalgary.ca/frenchcentre/.

Contact Information

Department Office: Craigie Hall D310

Phone: 403.220.5300

Fax: 403.284.3634

Email: fisl@ucalgary.ca

Website: fis.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Majors

Prospective students wishing to enter one of the BA programs offered by the Department of French, Italian and Spanish must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Admission to Honours French and Spanish

The Faculty of Arts procedures for "Admission to Honours" established in section 3.4.1

Honours Degrees with a Major Field are applicable and provide the overall framework for entry into the Honours Programs in French and Spanish. The application deadline is February 1.

Overlapping Programs

Programs offered by the Department of French, Italian and Spanish can only be taken in conjunction with the program in Linguistics and Language if the language in the former program differs from the chosen Language Option for the latter. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of French

The Field of French includes all courses labelled French (FREN). Students with advanced placement may use Romance Studies 499 to fulfil one of the exempted Major Field requirements. Students who have completed the minimum number of courses in the major field may use Romance Studies 499 as an additional course in the field of French.

Note: All mandatory courses will normally be offered each year. Other courses may be offered in alternate years.

Field of Italian

The Field of Italian Studies comprises the following:

Courses with an Italian Focus

- All courses labelled Italian (ITAL)
- Romance Studies 299, 341, 399 and 499

Contextual Courses

- Art History 327, 329 and 357
- Greek and Roman Studies 209, 315, 327 and 345
- Music 201
- Religious Studies 383

Note: All mandatory Italian courses will normally be offered each year. Other courses labelled Italian may be offered in alternate years.

Field of Spanish

The Field of Spanish includes all courses labelled Spanish (SPAN). Students with advanced placement may use Romance Studies 499 to fulfil one of the exempted Major Field requirements. Students who have completed the minimum number of courses in the major field may use Romance Studies 499 as an additional course in the field of Spanish.

Note: All mandatory courses will normally be offered each year. Other courses may be offered in alternate years.

4.28.1 Baccalauréat en français/BA in French

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. EXIGENCES POUR LE BACCALAURÉAT EN FRANÇAIS/MAJOR-FIELD REQUIREMENTS

La Section française du Département de français, d'italien et d'espagnol de l'Université de Calgary offre un programme d'étude complet de la langue et de la littérature françaises. Ce programme, de nature multidisciplinaire, est entièrement enseigné en français. Le programme de Baccalauréat (BA) est conçu pour développer les aptitudes linguistiques de l'étudiant jusqu'à un niveau très élevé. L'étudiant au BA apprendra la structure de la langue française, découvrira ses variations, et gagnera, ce faisant, un vaste fond de connaissances littéraires et culturelles dont le contenu traversera les siècles (du Moyen Âge à aujourd'hui), les cultures (la France, le Canada et toute la francophonie) et les média (la littérature et le cinéma notamment). Le Baccalauréat spécialisé (BA Honours) permet à l'étudiant d'approfondir ses connaissances linguistiques et culturelles tout en le préparant adéquatement pour les études supérieures, que ce soit en littérature, en linguistique, en éducation ou en traduction. Enfin, le Baccalauréat conjoint en Français et en Éducation (BA/BEd) prépare les étudiants à enseigner le français dans les réseaux d'enseignement primaires et secondaires tandis que les programme de Baccalauréat conjoints en français/italien et en français/espagnol intéresseront particulièrement les étudiants qui souhaitent jumeler leurs compétences en français à des compétences dans une deuxième langue romane.

Exigences: La concentration en français comprend un minimum de 48 unités (8.0 cours complets) et un maximum de 60 unités (10.0 cours complets), dont les suivants:

1. *Niveau 200:* French 213, 225 et 227.

2. *Niveau 300:* French 329, 369, plus 9 unités (1.5 cours complet) de français de niveau 300.

3. *Niveau 400: 15* unités (2.5 cours complets) de niveau 400.

4. *Niveau 500:* 9 unités (1.5 cours complets) de français de niveau 500.

Remarques:

- Les étudiants doivent choisir comme premier demi-cours celui qui correspond à leurs connaissances de la langue française. Ceux qui ont suivi French 30N, 30S, 31, French Language Arts (FLA) 30 ou leur équivalent s'inscriront d'habitude au cours French 225. Les étudiants qui ont suivi French 30 ou French N30 s'inscriront d'habitude au cours French 213 après lequel ils pourront s'inscrire au cours French 225. Il est fortement recommandé, en cas de doute, de s'adresser au Département avant la période normale des inscriptions. Les étudiants sont d'ailleurs encouragés à consulter le Département à chaque étape de leur programme.
- Les étudiants qui commencent en Français 209 ou 211 doivent compléter les exigences pour la concentration en français stipulées ci-dessus.
- Les étudiants qui sont placés à un niveau supérieur au cours French 225 dans la série des cours de langue doivent remplacer les cours dont ils sont dispensés par d'autres cours French (FREN) ou Romance Studies (ROST) de niveau 300 ou supérieur.
- Le Département recommande aux étudiants d'inclure parmi leurs options des cours FLIP (French Language Instruction Program) enseignés en français dans les autres départements. Un cours FLIP (French Language Instruction Program) peut compter pour 3 unités (0.5 cours complet).
- Le Département recommande aux étudiants de choisir des options reliées à leur concentration en français telles que la littérature franco-canadienne, l'histoire de France, du Québec ou de la francophonie internationale, la linguistique, Women's Studies, or African Studies. L'étudiant peut opter de suivre une mineure dans un autre département.
- Le Département recommande aux étudiants dont le français est la langue seconde de choisir French 489.01 (Phonologie).

The French Section of the Department of French, Italian and Spanish offers a comprehensive, multidisciplinary instruction in French language, linguistics and literature, using the target language. The BA program is designed to help students learn and achieve proficiency in French, understand its structure and variations, and gain a broad knowledge of French and Francophone literatures, by studying texts from different centuries, different countries, as well as by studying French-language films. The BA Honours deepens the foundation in French studies and provides excellent preparation for graduate studies in literatures or linguistics, as well as in education and translation. The BA/BEd, and the double-majors (French/Italian, French/Spanish), should be of particular value to students seeking to combine French with another degree.

Requirements: Students must successfully complete a minimum of 48 and a maximum of 60 units (8.0 and a maximum of 10.0 full-course equivalents) in the Field of French while fulfilling the following requirements:

1. *200-Level Courses:* French 213, 225 and 227.

2. *300-Level Courses:* French 329, 369, and 9 units (1.5 full-course equivalents) in French at the 300 level.

3. *400-Level Courses:* 15 units (2.5 full-course equivalents) in French at the 400 level.

4. *500-Level Courses:* 9 units (1.5 full-course equivalents) in French at the 500 level.

Notes:

- Students should choose a first course appropriate to their command of the language. Those with credit in French 30N, 30S, 31, French Language Arts (FLA) 30 or equivalent should normally enrol in French 225. Students with French 30 or French N30 should normally enrol in

French 213, after which they may enrol in French 225. In all cases of doubt students are strongly urged to seek the advice of the Department before the normal registration period, and indeed are encouraged to do so at all stages of their program of study.

- Students who start in French 209 or 211 must fulfill the requirements for French Majors specified above.
- Students who place higher than the French 225 level in the language-course sequence must replace those language courses by other senior French (FREN) or Romance Studies (ROST) courses.
- The Department recommends that students include among their options FLIP (French Language Instruction Program) courses taught in French in other departments. Three units (0.5 full-course equivalent) FLIP (French Language Instruction Program) may be counted toward the French Major.
- The Department recommends that students choose options related to the French Major, such as French-Canadian literature, the history of France, the history of Quebec and/or the Francophone world, Linguistics, Women's Studies or African Studies. The option to pursue an outside minor is at the student's discretion.
- The Department recommends that non-francophone students choose French 489.01 (Phonology) as the required course at the 400 level.

C. DEGREE OPTIONS

The BA in French can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.28.2 Baccalauréat spécialisé en français/BA Honours French

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. EXIGENCES POUR LE BACCALAURÉAT SPÉCIALISÉ EN FRANÇAIS/MAJOR-FIELD WITH HONOURS REQUIREMENTS

Exigences: La concentration en français comprend un minimum de 60 unités (10.0 cours complets) et un maximum de 72 unités (12.0 cours complets), dont les suivants:

1. *Niveau 200:* French 213, 225 et 227.

2. *Niveau 300:* French 329, 369 plus 9 unités (1.5 cours complet) de français de niveau 300.

3. *Niveau 400:* 18 unités (3.0 cours complets) de niveau 400.

4. *Niveau 500:* French 511 ainsi que 9 unités (1.5 cours complets) de niveau 500.

5. *Le Mémoire de Baccalauréat spécialisé:* French 598. (Le mémoire de baccalauréat spécialisé sera rédigé en français).

Remarques:

- Les étudiants doivent choisir comme premier demi-cours celui qui correspond à leurs connaissances de la langue française. Ceux qui ont suivi French 30N, 30S, 31, French Language Arts (FLA) 30 ou leur équivalent s'inscriront d'habitude au cours French 225. Les étudiants qui ont suivi French 30 ou French N30 s'inscriront d'habitude au cours French 213 après lequel ils pourront s'inscrire au cours French 225. Il est fortement recommandé, en cas de doute, de s'adresser au Département avant la période normale des inscriptions. Les étudiants sont d'ailleurs encouragés à consulter le Département à chaque étape de leur programme.
- Les étudiants qui commencent en Français 209 ou 211 doivent compléter les exigences pour le baccalauréat spécialisé en français (BA Honours) stipulées ci-dessus.
- Les étudiants qui sont placés à un niveau supérieur au cours French 225 dans la série des cours de langue doivent remplacer les cours dont ils sont dispensés par d'autres cours, French (FREN) ou Romance Studies (ROST) de niveau 300 ou supérieur.
- Le Département recommande aux étudiants d'inclure parmi leurs options des cours FLIP (French Language Instruction Program) enseignés en français dans les autres départements.
- Un cours FLIP (French Language Instruction Program) peut compter pour 3 unités (0.5 cours complet).
- Le Département recommande aux étudiants de choisir des options reliées à leur concentration en français telles que la littérature franco-canadienne, l'histoire de France, du Québec ou de la francophonie internationale, la linguistique, Women's Studies, ou African Studies. L'étudiant peut opter de suivre une mineure dans un autre département.
- Le Département recommande fortement aux étudiants de baccalauréat spécialisé d'effectuer un voyage d'études d'au moins un semestre dans un environnement francophone.
- Le Département recommande aux étudiants dont le français est la langue seconde de choisir French 489.01 (Phonologie).

Requirements: Students must successfully complete a minimum of 60 and a maximum of 72 units (10.0 and a maximum of 12.0 full-course equivalents) in the Field of French while fulfilling the following requirements:

1. *200-Level Courses:* French 213, 225 and 227.

2. *300-Level Courses:* French 329, 369 and 9 units (1.5 full-course equivalents) in French at the 300 level.

3. *400-Level Courses:* 18 units (3.0 full-course equivalents) in French at the 400 level.

4. *500-Level Courses:* French 511 and an additional 9 units (1.5 full-course equivalents) in French at the 500 level.

5. *Honours Thesis:* French 598. (The Honours Thesis will be written in French).

Notes:

- Students should choose a first course appropriate to their command of the language. Those with credit in French 30N, 30S, 31, French Language Arts (FLA) 30 or equivalent should normally enrol in French 225. Students with French 30 or French N30 should normally enrol in French 213, after which they may enrol in French 225. In all cases of doubt students are strongly urged to seek the advice of the Department before the normal registration period, and indeed are encouraged to do so at all stages of their program of study.
- Students who start in French 209 or 211 will have to fulfill the requirements for French Majors Honours specified above.
- Students who place higher than the 225 level in the language-course sequence must replace those language courses by other senior French (FREN) or Romance Studies (ROST) courses.
- The Department recommends that students include among their options FLIP (French Language Instruction Program) courses taught in French in other departments. Three units (0.5 full-course equivalent) FLIP (French Language Instruction Program) may be counted toward the French Honours Program.
- The Department recommends that students choose options related to the French Major, such as French-Canadian literature, the history of France, the history of Quebec and/or the Francophone world, Linguistics, Women's Studies or African Studies. The option to pursue an outside minor is at the student's discretion.
- The Department strongly recommends that students in the Honours Program study for at least one semester in a Francophone environment.
- The Department recommends that non-francophone students choose French 489.01 (Phonology) as the required course at the 400 level.

C. DEGREE OPTIONS

The BA Honours French can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.28.3 Concurrent BA (French)/BEd

Introduction

This five-year program leads to a Bachelor of Education from the Werklund School of Education and a Bachelor of Arts in French from the Faculty of Arts. A minimum of 150 units (25 full-course equivalents) must be successfully completed.

Present certification requirements of the Province of Alberta can be satisfied. When planning courses, students should take into consideration Alberta Teacher Certification Requirements. For details, refer to the Werklund School of Education website.

Admission

Students must meet the admissions requirements for both the Faculty of Arts and the Werklund School of Education (see A.2 Undergraduate Admission).

A. FACULTY OF ARTS REQUIREMENTS FOR CONCURRENT DEGREES

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

Students must complete a minimum of 42 units (7.0 full-course equivalents) in the field of French and are exempt from 3 units (0.5 full-course equivalent) French at the 400 level and 3 units (0.5 full-course equivalent) at the 500 level requirement of the BA in French. Students in this program must meet the requirements for the BEd degree set by the Werklund School of Education. See 4. BEd Program Details in their part of the calendar.

4.28.4 Minor in French

The Minor in French is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in French, including at least 18 units (3.0 full-course equivalents) at the 300 level or above.

Note: 6 units (1.0 full-course equivalent) from the French Language Instruction Program (FLIP) may be counted toward the minor.

Les exigences de la mineure en français sont précisées dans la section 3.4.3 des règlements de la faculté des Arts. Les étudiants doivent suivre un minimum de 30 unité (5 cours complets) et un maximum de 36 unité (6 cours complets) en français. Ce programme doit inclure au moins 18 unité (3 cours complets) au niveau 300 ou supérieur.

Les cours FLIP (French Language Instruction Program) peuvent compter pour 6 unité (1.0 cours complet).

4.28.5 BA in Italian Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students should choose a first course appropriate to their command of the language. Students with no previous training in Italian will normally begin with Italian 201. In all cases of doubt students are strongly urged to seek the advice of the Department and indeed are encouraged to do so at all stages of their program of study.

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Italian Studies while fulfilling the following requirements:

1. *200-Level Courses:* Italian 201 and 203.

2. *300-Level Courses:* Italian 301 and 303, plus 6 units (1.0 full-course equivalent) in Italian at the 300 level

2. *400-Level Courses:* 6 units (1.0 full-course equivalent) in Italian at the 400 level.

3. *500-Level Courses:* 6 units (1.0 full-course equivalent) in Italian at the 500 level.

4. *Italian Studies Options:* 12 units (2.0 full-course equivalents) from the Field of Italian Studies, of which: (a) a maximum of 6 units (1.0 full-course equivalent) can be labelled Romance Studies, and (b) a maximum of 6 units (1.0 full-course equivalent) can be taken from the Contextual Courses in the field of Italian Studies.

C. DEGREE OPTIONS

The BA in Italian Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: A student with advanced placement will be required to begin with a higher level course, and must substitute approved courses for those language courses not required.

4.28.6 Minor in Italian Studies

The Minor in Italian is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the field of Italian Studies, of which:

(a) A maximum of 6 units (1.0 full-course equivalent) can be labelled Romance Studies,

(b) A maximum of 6 units (1.0 full-course equivalent) can be from the Contextual Courses in the Field of Italian Studies, and

(c) At least 18 units (3.0 full-course equivalents) must be at the senior level.

Note: Students who place higher than Italian 201 level must substitute approved courses for those language courses that are not required.

4.28.7 BA in Spanish

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students should choose a first course appropriate to their command of the language. Students with no previous training in Spanish will normally begin with Spanish 201. Those with credit in Spanish 30, 31 or equivalent should normally enrol in Spanish 203. In all cases of doubt students are strongly urged to seek the advice of the Department and indeed are encouraged to do so at all stages of their program of study.

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Spanish while fulfilling the following requirements:

1. *Core Language Sequence*: 21 units (3.5 full-course equivalents) consisting of Spanish 201, 203, 301, 303 and 323, 405, 505. Spanish 205 can be substituted for Spanish 203 and 301.

2. *Upper-Level Courses*:

(a) 12 units (2.0 full-course equivalents) from courses labelled Spanish at the 400 level.

(b) 9 units (1.5 full-course equivalents) from the field of Spanish at the 500 level.

C. DEGREE OPTIONS

The BA in Spanish can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- The Department offers language courses and non-language courses. The language sequence in B.1 must be taken in the set order except that Spanish 303 and 323 may be and normally should be taken concurrently. Since careful degree planning is necessary to meet prerequisites, students should work closely with the Department and the Arts Students' Centre.
- Students entering with Spanish 30 or the equivalent may be exempted from Spanish 201 and enter directly into Spanish 203 or 205. Please consult with the Department for appropriate placement. Students starting at a higher level than Spanish 201 must replace those language courses from which they have been exempted by any Spanish non-language courses (literature, linguistics, civilization, culture) or by any senior Romance Studies (ROST) courses.
- Spanish 205 is a 6 unit course (1.0 full-course equivalent) offered in a single term that is designed primarily for students entering with Spanish 30 or equivalent who wish to progress quickly though the curriculum.
- It is strongly recommended that students, in consultation with the Department, choose an area of focus consisting of at least 12 units (2.0 full-course equivalents) from disciplines related to their interests in the Hispanic world (from areas such as Political Science, History, Latin American Studies or Women's Studies).

4.28.8 BA Honours Spanish

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Spanish while fulfilling the following requirements:

1. *Core Language Sequence*: 21 units (3.5 full-course equivalents) consisting of Spanish 201, 203, 301, 303 and 323, 405, 505. Spanish 205 can be substituted for Spanish 203 and 301.

2. *Upper-Level Courses*:

(a) 15 units (2.5 full-course equivalents) from the field of Spanish at the 400 level.

(b) 12 units (2.0 full-course equivalents) from the field of Spanish at the 500 level.

4. *Capstone*: Spanish 598.

C. DEGREE OPTIONS

The BA Honours Spanish can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- The Department offers language courses and non-language courses. The language sequence in B.1 must be taken in the set order except that Spanish 303 and 323 may be and normally should be taken concurrently. Since careful degree planning is necessary to meet prerequisites, students should work closely with the Department and the Arts Students' Centre.
- Students entering with Spanish 30 or the equivalent may be exempted from Spanish 201 and enter directly into Spanish 203 or 205. Please consult with the Department for appropriate placement. Students starting at a higher level than Spanish 201 must replace those language courses from which they have been exempted by any Spanish non-language courses (literature, linguistics, civilization, culture) or by any senior Romance Studies (ROST) courses.
- Spanish 205 is a six unit course (full-course equivalent) offered in a single term that is designed primarily for students entering with Spanish 30 or equivalent who wish to progress quickly though the curriculum.
- It is strongly recommended that students, in consultation with the Department, choose at least 12 units (2.0 full-course equivalents) in an area of focus from disciplines related to their interests in the Hispanic world (from areas such as Political Science, History, Latin American Studies or Women's Studies).
- Students in the Honours Program are strongly encouraged to study for at least one semester in a Hispanophone environment.
- Students are also encouraged to complete Spanish 475 as part of the 54 units (9.0 full-course equivalents) required for the Honours Program.

4.28.9 Minor in Spanish

The Minor in Spanish is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in Spanish including at least 18 units (3.0 full-course equivalents) at the senior level.

Note: Students who place higher than Spanish 201 level must replace those language courses from which they have been exempted by any Spanish non-language courses or any senior Romance Studies (ROST) courses.

4.28.10 Double Majors within the Department of French, Italian and Spanish

Students are encouraged to consider double majors in: French and Italian, French and Spanish, or Italian and Spanish. Combining other majors within the Faculty of Arts is also acceptable.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in both of the selected Major Fields and meet the appropriate requirements:

- Where French is one of the two majors, students follow the requirements in section 4.28.1, subsection B except that for requirement B3 only 12 units (rather than 15 units) (2.0 (rather than 2.5) full-course equivalents) are required at the 400 level and B4 only 6 units (rather than 9 units) (1.0 (rather than 1.5) full-course equivalents) is required at the 500 level.
- Where Italian is one of two majors, students follow the requirements in section 4.28.5, subsection B.
- Where Spanish is one of the two majors, students follow the requirements in section 4.28.7, subsection B.

Notes:

- Students are strongly advised to study for at least one semester each in a Francophone, Italophone or a Hispanophone environment as applicable to their double major.
- It is understood in the Double Major programs that the 42 units (7.0 full-course equivalents) is a minimum requirement. Students are encouraged to take additional courses in their areas of specialization.

C. DEGREE OPTIONS

The BA with Double Majors in French and Italian, French and Spanish or Italian and Spanish can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.29 Geography

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Degrees in Geography:

Bachelor of Arts (BA) in Geography

Bachelor of Arts (BA) in Urban Studies

BA Honours in Geography

BA in Geography with Co-operative Education

BA Honours in Geography with Co-operative Education

Bachelor of Science (BSc) in Geography

BSc Honours in Geography

BSc in Geography with Co-operative Education

BSc Honours in Geography with Co-operative Education

BA in Urban Studies with Co-operative Education

Concurrent BA in Geography and Bachelor of Education

Concurrent BSc in Geography and Bachelor of Education

Degrees in Earth Science

Bachelor of Science (BSc) in Earth Science

BSc in Earth Science with Co-operative Education

BSc Honours in Earth Science

BSc Honours in Earth Science with Co-operative Education

Related Interdisciplinary Degrees (See separate listings):

BSc and Honours BSc in Environmental Science (Faculty of Science)

Note: Minors are offered in Geography, Earth Science and Urban Studies.

Introduction

The Department offers programs in Geography, Earth Science and Urban Studies. The Department of Geography also participates in the Environmental Science program, which is housed in the Faculty of Science.

Geography students wishing to emphasize the social sciences and humanities in their programs should register in the BA degree; those who wish to emphasize the biological and natural sciences should register in the BSc degree. The Honours BA and BSc programs provide enhanced:

- Understanding of Geography
- Competencies in field work techniques, research methods, and presentation skills
- Preparation for entry to advanced degree programs.

The Earth Science program is a single, four-year interdisciplinary program offered by the Faculty of Arts with collaboration from the Faculty of Science. The Department of Geography and the Department of Geoscience are the principal participants in the program in the respective faculties. Since this is a restricted-entry program, students should contact the Earth Science Advisor as early as possible for proper advice regarding the program.

Students completing a BSc or BSc Honours in Earth Science will be eligible for consideration for admission to the graduate program in Geography at the University of Calgary and will be eligible for consideration for admission to the graduate program in the Department of Geoscience. Especially in the latter case, additional course work is likely to be required.

The Urban Studies program provides a strong background for students interested in working in public and private sector fields including urban and regional planning, ar-

chitecture, environmental design, economic development, city administration, social services and policy, cultural programming, urban politics, and education.

APEGA Regulations

The practice of geology and geophysics in Alberta is governed by Provincial law and regulated by the Association of Professional Engineers and Geoscientists of Alberta (APEGA). The Earth Science program is not designed to meet those requirements. Persons intending to pursue geology or geophysics as a profession should obtain a BSc or BSc Honours in Geology or Geophysics.

Contact Information

Department Office: Earth Sciences 356

Phone: 403.220.5584

Fax: 403.282.6561

Email: geograph@ucalgary.ca

Urban Studies Co-ordinator: ubstprog@ucalgary.ca

Website: geog.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA or BSc (Geography) Program, the BSc (Earth Science) Program or the BA (Urban Studies) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

The Faculty of Arts procedures for Admission to the BA or BSc Honours (Geography) or the BSc Honours (Earth Science) are established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. The application deadline is February 1.

Overlapping Programs

Programs in Geography cannot be taken in conjunction with programs in: Earth Science; Environmental Science or Urban Studies. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of Earth Sciences

The Interdisciplinary Field of Earth Science consists of the following courses:

- Archaeology 201, 413, 417, 453, 515, 531, 533.26 and 596
- Earth Science 401 and 501
- Geography 211, 231, 305, 307, 311, 313, 321, 333, 357, 391, 403, 407, 411, 413, 415, 417, 421, 433, 457, 503, 509, 519, 531, 537 and 599
- Geology 201, 202, 307, 313, 337, 343, 353, 381, 401, 441, 471, 475, 510, 555 and 561
- Geophysics 351, 355, 375, 509 and 565

Course Enrolment Limitations

Geology 313, 323, 333, 343, 353, 381, 401, 441, 493, Geophysics 351, 355 and 565 are limited enrolment courses. Earth Science Majors will have priority registration in Geology 313, 343, 353, 381 and Geophysics 351 and 355.

Field of Geography

The Field of Geography consists of all courses labelled Geography (GEOG). Geography courses are subdivided as follows:

Human Geography (List A): Geography 251, 253, 321, 341, 351, 361, 365, 367, 371, 377, 381, 397, 421, 425, 429, 451, 463, 465, 470, 479, 517, 521, 529, 553, 555, 561, 565, 597; Anthropology/Archaeology 523.

Physical Geography (List B): Geography 211, 231, 305, 307, 313, 315, 333, 357, 403, 407, 411, 413, 415, 417, 433, 457, 503, 507, 509, 516, 517, 519, 522, 531, 533, 537, 567, 599.

Other Geography Courses (List C): Geography 205, 213, 311, 317, 339, 391, 392, 393, 394, 395, 437, 439, 591, 593.

Field of Urban Studies

The Interdisciplinary Field of Urban Studies consists of the following categories and courses:

1. Core Courses

Urban Studies 253 and 591, Geography 341, 351 and 451.

Anthropology 379, Canadian Studies 355, Economics 365, Geography 521, 553, 565, History 354, Political Science 425, Sociology 353, Urban Studies 311.

2. Research Methods for Urban Studies

The following Research Methods courses are relevant to the Field of Urban Studies:

A. Qualitative Methods:

Anthropology 411; Communication and Media Studies 313; Communication and Media Studies 371; English 302; Geography 340; History 300; Political Science 357; Sociology 313*, 413

B. Quantitative Methods:

Economics 395; Geography 339, 439; Political Science 399; Sociology 311, 313*, 315; Courses labelled Statistics

**Sociology 313 may be counted towards either the Qualitative or Quantitative requirement.*

C. Geospatial Methods

Geography 357, 437, 457

3. Urban Studies Options

All courses labelled Urban Studies; Anthropology 479; Archaeology 325; East Asian Studies 321; Geography 463, 465, 470, 479, 555; Greek and Roman Studies 325, 327, 445, 447; Political Science 447, 451; Sociology 355, 375, 453, 467, 471, 499. Students admitted to the Architectural Studies minor may use Architectural Studies 457.01, 457.02 towards this requirement.

Up to 6 units (1.0 full-course equivalent) from Geography 394, 395 (Overseas Field Schools) may be considered when content is Urban focused. Sociology 499 (Sociology Field School) may also be considered when content is Urban focused.

Notes:

- Most of the courses listed above have prerequisites that lie outside the Field of Urban Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.
- Courses with a strong urban component may be approved by the Program Director. Advanced students with strong academic records may also consider a number of 600-level courses offered through the Faculty of Environmental Design.

4.29.1 BA in Geography

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of units 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Geography while fulfilling the following requirements:

1. *Introduction:* Geography 211, 231, and one of 251 or 253.

2. *Physical Geography:* 6 units (1.0 full-course equivalent) from: Geography 305, 307 and 313.

3. *Human Geography:* 9 units (1.5 full-course equivalents) from: Geography 321, 341, 351, 361, 365 and 367.

4. *Analytic Methods:* Geography 339.

5. *Field Studies:* Geography 391.

6. *Regional Geography and/or Overseas Field Studies:* 6 units (1.0 full-course equivalent) from: Geography 371, 377, 381, 392, 393, 394, 395, 397 and 593. Geography 381 is strongly recommended.

7. *Upper-Level Courses:* 12 units (2.0 full-course equivalents) in Geography at the 400 or 500 level, including at least 6 units (1.0 full-course equivalent) selected from "Human Geography" (List A). The remaining courses should preferably be selected from "Human Geography" (List A) or "Other Geography Courses" (List C). (See the Field of Geography.)

8. *Human Geography Emphasis:* At least 36 units (6.0 full-course equivalents) (inclusive of all courses used to fulfill requirements 1-7 above) from "Human Geography" (List A) and "Other Geography Courses" (List C).

C. OTHER REQUIREMENTS

Technical Writing: 3 units (0.5 full-course equivalent) from: Communication and Media Studies 363, 369 and Science 311.

D. DEGREE OPTIONS

The BA in Geography can be taken with Co-operative Education. See section 3.4.4

Co-operative Education Programs for information and requirements.

Notes:

- Students should consult with the Geography Undergraduate Co-ordinator or advisors concerning their selection of 400- and 500-level courses.
- In meeting Requirement 7 pertaining to "Upper-Level Courses," students should take 12 units (2.0 full-course equivalents) from Lists A and C if they do not wish to take extra courses in the Field of Geography, beyond the 48 units (8.0 full-course equivalent) minimum, to meet Requirement 8.
- It is strongly recommended that students take Geography 391 at the beginning of the second year.
- Students planning to pursue graduate studies in Geography are advised to take Geography 439.

4.29.2 BSc in Geography

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Geography while fulfilling the following requirements:

1. *Introduction:* Geography 211, 231, and one of 251 or 253.

2. *Physical Geography:* 6 units (1.0 full-course equivalent) from: Geography 305, 307 and 313.

3. *Human Geography:* 6 units (1.0 full-course equivalent) from: Geography 321, 341, 351, 361, 365 and 367.

4. *Analytic Methods:* Geography 339 and 3 units (0.5 full-course equivalent) from: Geography 333, 357, 437 or 439.

5. *Field Studies:* Geography 391.

6. *Regional Geography and/or Overseas Field Studies:* 6 units (1.0 full-course equivalent) from: Geography 371, 377, 381, 392, 393, 394, 395, 397 and 593.

7. *Upper-Level Courses:* An additional 12 units (2.0 full-course equivalents) in Geography at the 400 or 500 level, including at least 6 units (1.0 full-course equivalent) selected from "Physical Geography" (List B). The remaining courses should preferably be selected from "Physical Geography" (List B) and "Other Geography Courses" (List C). (See the Field of Geography.)

8. *Physical Geography Emphasis:* At least 33 units (5.5 full-course equivalents) (inclusive of all courses used to fulfill requirements 1-7 above) from "Physical Geography" (List B) and "Other Geography Courses" (List C).

C. OTHER REQUIREMENTS

1. *Technical Writing Requirement:* 3 units (0.5 full-course equivalent) from: Communication and Media Studies 363, 369 and Science 311.

2. *Science Requirement:* 6 units (1.0 full-course equivalent) from: Biology 241, 243; Chemistry 201 or 211, 203 or 213; Computer Science 217, 219, 231; Mathematics 211 or 213; Mathematics 249 or 265 or 275; Physics 211, 221, 223; or any senior courses offered by the Faculty of Science and having one of these as a prerequisite.

D. DEGREE OPTIONS

The BSc in Geography can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students should consult with the Geography Undergraduate Co-ordinator or advisors concerning their selection of 400- and 500-level courses.
- In meeting Requirement 6 and 7 pertaining to "Upper-Level Courses" and "Regional Geography and Overseas Field Studies," students should take 15 units (2.5 full-course equivalents) from Lists B and C if they do not wish to take extra courses in the Field of Geography beyond the 48 units (8.0 full-course equivalent) minimum in the process of meeting Requirement 8.
- It is strongly recommended that students take Geography 391 at the beginning of the second year.
- Students planning to pursue graduate studies in Geography are advised to take Geography 439.
- Students may need additional prerequisites to enrol in senior-level courses.
- Some of these courses have particular requirements for high school courses in addition to those required for entry into the Faculty of Arts. Please consult the course listings in this Calendar.

4.29.3 BA Honours Geography

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Geography while fulfilling the following requirements:

1. *Introduction:* Geography 211, 231, and one of 251 or 253.

2. *Physical Geography:* 6 units (1.0 full-course equivalent) from: Geography 305, 307 and 313.

3. *Human Geography:* 9 units (1.5 full-course equivalents) from: Geography 321, 341, 351, 361, 365 and 367.

4. *Analytic Methods:* Geography 339.

5. *Field Studies:* Geography 391.

6. *Regional Geography and/or Overseas Field Studies:* 6 units (1.0 full-course equivalent) from: Geography 371, 377, 381, 392, 393, 394, 395, 397 and 593. Geography 381 is strongly recommended.

7. *Honours Paper:* Geography 597.97.

8. *Upper-Level Courses:* An additional 12 units (2.0 full-course equivalents) in Geography at the 400 or 500 level, including at least 6 units (1.0 full-course equivalent) selected from "Human Geography" (List A). The remaining courses should preferably be selected from "Human Geography" (List A) and "Other Geography Courses" (List C). (See the Field of Geography.)

9. *Geography Options:* An additional 9 units (1.5 full-course equivalents) from the Field of Geography with at least 0.5 full-course equivalent in "Other Geography Courses" (List C).

10. *Human Geography Emphasis*: At least 36 units (6.0 full-course equivalents) (inclusive of all courses used to fulfill requirements 1-9 above) from "Human Geography" (List A) and "Other Geography Courses" (List C).

C. OTHER REQUIREMENTS

Technical Writing Requirement: 3 units (0.5 full-course equivalent) from: Communication and Media Studies 363, 369 and Science 311.

D. DEGREE OPTIONS

The BA Honours in Geography can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students should consult with the Geography Undergraduate Co-ordinator or advisors concerning their selection of 400- and 500-level courses.
- It is strongly recommended that students take Geography 391 at the beginning of the second year.
- Students planning to pursue graduate studies in Geography are advised to take Geography 439.

4.29.4 BSc Honours Geography

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Geography while fulfilling the following requirements:

1. *Introduction:* Geography 211, 231, and one of 251 or 253.

2. *Physical Geography:* 6 units (1.0 full-course equivalent) from: Geography 305, 307 and 313.

3. *Human Geography:* 6 units (1.0 full-course equivalent) from: Geography 321, 341, 351, 361, 365 and 367.

4. *Analytic Methods:* Geography 339 and 3 units (0.5 full-course equivalent) from: Geography 333, 357, 437 or 439.

5. *Field Studies:* Geography 391.

6. *Honours Paper:* Geography 599.99.

7. *Regional Geography and/or Overseas Field Studies:* 6 units (1.0 full-course equiva-

lent) from: Geography 371, 377, 381, 392, 393, 394, 395, 397 and 593.

8. *Upper-Level Courses:* An additional 12 units (2.0 full-course equivalents) in Geography at the 400 or 500 level, including at least 6 units (1.0 full-course equivalent) selected from "Physical Geography" (List B). The remaining courses should preferably be selected from "Physical Geography" (List B) and "Other Geography Courses" (List C). (See the Field of Geography.)

9. *Geography Options:* An additional 9 units (1.5 full-course equivalents) from the Field of Geography with at least 3 units (0.5 full-course equivalent) in "Other Geography Courses" (List C).

10. *Physical Geography Emphasis:* At least 33 units (5.5 full-course equivalents) (inclusive of all courses used to fulfill requirements 1-9 above) from "Physical Geography" (List B) and "Other Geography Courses" (List C).

C. OTHER REQUIREMENTS

1. *Technical Writing Requirement:* 3 units (0.5 full-course equivalent) from: Communication and Media Studies 363, 369 and Science 311.

2. *Science Requirement:* a total of 18 units (3.0 full-course equivalents) from the following:

(a) 12 units (2.0 full-course equivalents) from: Biology 241, 243; Chemistry 201 or 211, 203 or 213; Physics 211, 221, 223;

(b) 6 units (1.0 full-course equivalent) from: Computer Science 217, 219, 231; Mathematics 211 or 213; Mathematics 249 or 265 or 275; Mathematics 253 or 267.

Any senior courses offered by the Faculty of Science and having one of these as a prerequisite may be substituted for a course in this list.

D. DEGREE OPTIONS

The BSc Honours in Geography can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students should consult with the Geography Undergraduate Co-ordinator or advisors concerning their selection of 400- and 500-level courses.
- In meeting Requirement 7-9 pertaining to "Upper-Level Courses," "Regional Geography and Overseas Field Studies" and "Geography Options," students should take 12 units (2.0 full-course equivalents) from Lists B and C if they do not wish to take extra courses in the Field of Geography, beyond the 60 units (10.0 full-course equivalent) minimum, to meet Requirement 10.
- It is strongly recommended that students take Geography 391 at the beginning of the second year.
- Students planning to pursue graduate studies in Geography are advised to take Geography 439.
- Students may need additional prerequisites to enrol in senior-level courses.
- Some of these courses have particular requirements for high school courses in addition to those required for entry into the Faculty of Arts. Please consult the course listings in this Calendar.

4.29.5 Minor in Geography

The Minor in Geography is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Geography with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.29.6 BSc in Earth Science

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete exactly 63 units (10.5 full-course equivalents) in the Field of Earth Science while fulfilling the following requirements:

1. Core Courses:

(a) Archaeology 201; and one of Archaeology 453, 515, 531, or 596;

(b) Geography 211, 231, 305, 313 and 391;

(c) Geography 307 or Geology 353;

(d) Geology 201, 202, 313;

(e) Geophysics 351 or 355;

(f) 3 units (0.5 full-course equivalent) selected from the following: Geology 307, Geography 417, Archaeology 417, 515, 533.26;

(g) Geophysics 375 or Geography 311;

(h) Geology 337, 343 and 381 or 9 units (1.5 full-course equivalents) from Earth Science 401 and 501.

2. Upper-Level Earth Science Options: 9 units (1.5 full-course equivalents) chosen freely from among the following:

- Archaeology 413
- Earth Science 401, 501
- Geography 311, 321 403, 407, 411, 413, 415, 417, 421, 433, 457, 503, 509, 519, 531, 537
- Geology 401, 555, 561
- Geophysics 565

3. Methods: Geography 333 or 357.

Note: It is critical that students wishing to major in Earth Sciences complete the prerequisites for Geophysics 351 and 355 (Mathematics and Physics) during the early stages of their program or risk delays in graduation.

C. OTHER REQUIREMENTS

1. Mathematics: Mathematics 249 or 265 or 275;

2. Chemistry: Chemistry 201 or 211;

3. Physics 211 or 221;

4. Science 311;

3. Science Options: 6 units (1.0 full-course equivalent) from: Astrophysics 213; Biology 241, 243; Chemistry 203 or 213; Mathematics 211 or 213; and Physics 223.

Note that Physics 223 may be required for entry to some options in Geology or Geophysics.

D. DEGREE OPTIONS

The BSc in Earth Science can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.29.7 BSc Honours Earth Science

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 66 units (11.0 full-course equivalents) in the Field of Earth Science and fulfill the following requirements:

1. Core Courses:

(a) Archaeology 201; and one of Archaeology 453, 515, 531, or 596;

(b) Geography 211, 231, 305, 313, and 391;

(c) Geography 307 or Geology 353;

(d) Geology 201, 202, 313;

(e) Geophysics 351 or 355;

(f) 3 units (0.5 full-course equivalent) selected from the following: Geology 307, Geography 417, Archaeology 417, 515, 533.26;

(g) Geophysics 375 or Geography 311;

(h) Geology 337, 343, and 381 or 9 units (1.5 full-course equivalents) from Earth Science 401 and 501.

2. Upper-Level Earth Science Options: Sufficient courses chosen freely from among the following to make up 66 units (11.0 full-course equivalents):

- Archaeology 413
- Earth Science 401, 501
- Geography 311, 321, 403, 407, 411, 413, 415, 417, 421, 433, 457, 503, 509, 519, 531, 537
- Geology 401, 555, 561
- Geophysics 565

3. Methods: Geography 333 or 357.

4. Capstone: Archaeology 596, Geography 599, Geology 510 or Geophysics 509.

Note: It is critical that students wishing to major in Earth Sciences complete the prerequisites for Geophysics 351 and 355 (Mathematics and Physics) during the early stages of their program or risk delays in graduation.

C. OTHER REQUIREMENTS

1. Mathematics: Mathematics 249 or 265 or 275;

2. Chemistry: Chemistry 201 or 211;

3. Physics 211 or 221;

4. Science 311;

5. Science Options: 1.0 full-course equivalents from: Astrophysics 213; Biology 241, 243; Chemistry 203 or 213; Mathematics 211 or 213; and Physics 223.

Note that Physics 223 may be required for entry to some options in Geology or Geophysics.

D. DEGREE OPTIONS

The BSc in Earth Science can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.29.8 Minor in Earth Science

The Minor in Earth Science is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields.

1. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Earth Science including:

(a) Archaeology 201;

(b) Geography: 9 units (1.5 full-course equivalents) from Geography courses within the Field of Earth Science;

(c) Geology 201 and 202;

(d) Geology or Geophysics: 6 units (1.0 full-course equivalent) from Geology and/or Geophysics courses within the Field of Earth Science (with the exception of Geology 510);

(e) 6 units (1.0 full-course equivalent) from the Field of Earth Science.

2. Chemistry and Mathematics: Chemistry 201 or 211, and Mathematics 249 or 265 or 275.

4.29.9 BA in Urban Studies

A. Faculty of Arts Requirements

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. Major-Field Requirements

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Urban Studies while fulfilling the following requirements:

1. *Core Courses*: 21 units (3.5 full-course equivalents) including:

(a) Urban Studies 253, 591; Geography 341, 351 and 451;

(b) 6 units (1.0 full-course equivalent) from Anthropology 379; Canadian Studies 355; Economics 365; Geography 521, 553, 565; History 354; Political Science 425; Sociology 353; Urban Studies 311.

2. *Research Methods*: 12 units (2.0 full-course equivalents) from the "Research Methods for Urban Studies" (listed under Field of Urban Studies) with:

(a) 6 units (1.0 full-course equivalent) from any one of the “Qualitative Methods,” “Quantitative Methods” or “Geospatial Methods” lists; and

(b) 6 units (1.0 full-course equivalent) can be distributed in any way from the remaining two “Methods” lists.

3. An additional 15 units (2.5 full-course equivalents) from the “Field of Urban Studies” including Core, Methods, and Options courses.

Notes:

- Other courses with a strong urban component may be approved by the Program Co-ordinator.
- The following courses are prerequisites for many of the senior courses in the program. It is strongly recommended to include Geography 231, Anthropology 203, and Sociology 201 as early as possible in the program. Failure to do so will significantly impact students’ choices. Students may also wish to consider Economics 201 and 203 and Political Science 321.

C. Degree Options

The BA in Urban Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students should pay close attention to course prerequisites when making their course selections.
- Some courses may only be offered in alternate years so students should take care to plan their courses beyond the immediate year. Students should consult the Urban Studies Director when making their course selections.

4.29.10 Minor in Urban Studies

The Minor in Urban Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Urban Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The Urban Studies Minor also requires:

1. Urban Studies 253, 591.

2. 24 units (4.0 full-course equivalents) with:

(a) At least 12 units (2.0 full-course equivalents) from: Anthropology 379; Canadian Studies 355; Economics 365; Geography 341, 351, 451 521, 553, and 565; Political Science 425; and Sociology 353 and 453;

(b) 12 units (2.0 full-course equivalents) from the Field of Urban Studies including Core, Methods, and Options.

Notes:

- Courses with a strong urban component may be approved by the Program Co-ordinator.
- No student may count more than 18 units (3.0 full-course equivalents) from any one discipline toward the Urban Studies Minor.

4.30 German

See Linguistics, Languages, and Culture.

4.31 Germanic, Slavic and East Asian Studies

See Linguistics, Languages, and Culture

4.32 Greek

See Classics and Religion.

4.33 Greek and Roman Studies

See Classics and Religion.

4.34 History

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Degrees in History:

Bachelor of Arts (BA) in History

BA in History with Co-operative Education

BA Honours in History

BA Honours in History with Co-operative Education

Concurrent BA in History and Bachelor of Education

Degrees in Canadian Studies:

Bachelor of Arts (BA) in Canadian Studies

BA in Canadian Studies with Co-operative Education

BA Honours in Canadian Studies

BA Honours in Canadian Studies with Co-operative Education

Concurrent BA in Canadian Studies and Bachelor of Education

Degrees in Latin American Studies:

Bachelor of Arts (BA) in Latin American Studies

BA in Latin American with Co-operative Education

Related Interdisciplinary Degrees (See separate listings):

BA and BA Honours in Ancient and Medieval History

Note: Minors are offered in History, Canadian Studies, and Latin American Studies.

Introduction

The Department of History offers instruction in a broad range of historical fields. The Programs in History provide a broad liberal arts education, with widespread application. The BA Honours in History deepens the foundation in historical studies and provides excellent preparation for graduate studies in history as well as fields such as education, law, journalism and public administration.

The Department strongly recommends that students do not concentrate their studies in one period or thematic area. The Department encourages breadth in History and that students take courses about different chronological eras, in different geographic areas, and from different analytical perspectives.

The Canadian Studies program offers an introduction to Canadian literature, the arts, politics and society. It is designed for those who might wish to pursue careers in government, law, education, communications or in other areas where a thorough knowledge of Canada is necessary. The program is interdisciplinary, which allows students to benefit from exposure to faculty members and ideas and developments from different fields.

First year students in Canadian Studies are encouraged to explore courses in a variety of areas. It is recommended that a first year program include: Canadian Studies 201 and at least an additional 9 units (1.5 full-course equivalents) from the Faculty of Arts. Competency in a second language is highly rec-

ommended. Degree programs in Canadian Studies include optional senior-level courses offered by various Departments. It is therefore useful to take first year courses from a variety of related areas such as history and political science.

Students seeking advice on first year course selection may contact the Arts Students' Centre.

Building upon the University's historical strength in issues relating to Latin America, this state-of-the-art degree program offers students diverse learning environments, and seeks to maximize opportunities for students to experience Latin America first-hand. The program stresses the development of a critical and informed view of Latin America, linguistic skills, independent research and writing abilities, and cultural sensitivity. This major program prepares students for work in the public and private sectors in Canada that deal with Latin American countries and cultures. Graduates may find work opportunities in the diplomatic and the civil service, business, journalism, teaching and tourism.

Students are strongly encouraged to combine the Latin American Studies Major with another major or minor and to take a semester of study at a Latin American university through one of the many exchange agreements that the University of Calgary maintains.

Contact Information and Program Advice

Department Office: Social Sciences 656

Phone: 403.220.6401

Fax: 403.289.8566

Email: histdept@ucalgary.ca

Website: hist.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (History) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Admission to Honours

The Faculty of Arts procedures for Admission to BA Honours (History or Canadian Studies) established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. The application deadline is February 1.

In addition to having successfully completed at least 30 units (5.0 full-course equivalents) of post-secondary study, students must have completed at least 3 units (0.5 full-course equivalent) in History to enter the Honours program. The Honours Advisor will advise anyone who might be interested in joining the program. Students should consult with the Honours Advisor annually concerning their course selection. In addition to completing the online application in the Student Centre by the application deadline, a supplemental application must be submitted by January 15. The supplemental application can be found on the Department of History website (hist.ucalgary.ca/). Students are encouraged to consult with the Honours Advisor well before the deadline to determine their eligibility.

Students majoring in Canadian Studies are eligible to apply for Honours by the February 1 deadline only if they will complete the program during the following academic year.

In addition to completing an application in the online Student Centre by the deadline, students must submit a completed application form for Interdisciplinary Studies 590 (Honours Thesis) to the Program Co-ordinator. The application form must be signed by a thesis supervisor and include preliminary thesis proposal. To meet the deadline, it is recommended that students wishing to enrol in the Honours program obtain guidelines and an application form from the Program Co-ordinator no later than January 15. Students are strongly advised to secure a thesis supervisor by January 15.

Overlapping Programs

Programs in History cannot be taken in conjunction with programs in Ancient and Medieval History. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of History

The Field of History consists of all courses labelled History (HTST) except History 200. It also includes Greek and Roman Studies (GRST) 315, 337, 339, 345, 347, 425 and 433*.

**A maximum of 6 units (1.0 full-course equivalent) Greek and Roman Studies course may be used towards the major field. Greek and Roman Studies courses do not count towards the minor field.*

Field of Canadian Studies

The Field of Canadian Studies includes:

Thematic Clusters

1. Canadian and American Contexts and Comparisons

Strongly Recommended Courses: Canadian Studies 333, 341, 451.

Additional Courses: Canadian Studies 401*; Communication and Media Studies 435; Economics 323, 325, 329; English 372; History 345, 347, 349, 357, 359, 361, 367, 381, 383, 412, 431, 439, 443, 447, 459, 460, 463, 467, 472, 485, 490, 523, 526.

2. Canada and the Urban Setting

Strongly Recommended Courses: Canadian Studies 355, 361, 439, 433, 451.

Additional Courses: Anthropology 379, 479; Architectural Studies 201, Canadian Studies 401*; Economics 355; Geography 253, 321, 351, 361, 365, 367, 429, 451, 463, 479, 553, 555, 565; History 354, 472; Sociology 353, 453; Urban Studies 253.

3. Canadian Environmental Perspectives

Strongly Recommended Course: Canadian Studies 333.

Additional Courses: Canadian Studies 401*; Economics 473; History 354, 437; Geography 251, 305, 311, 381, 429, 517, 519, 522; Science, Technology and Society 343, 401*.

4. First Nations, Duality and Ethnicity

Strongly Recommended Courses: Canadian Studies 339, 361, 433, 451.

Additional Courses: Anthropology 213, 321, 323, 355, 421; Archaeology 419, Art History 367; Canadian Studies 401*; East Asian Studies 201, 319, 321; History 209, 303, 317, 337, 340, 345, 357, 397.01, 397.02, 404, 442, 443, 447, 523, 529, 547; Indigenous Studies 317, 343, 397, 401, 415; Political Science 279, 369, 470; Sociology 307, 309, 375, 405, 467, 475.

Language Courses

French, Indigenous Languages, Arabic, Chinese, German, Italian, Japanese, Russian, Spanish (see Notes for more information).

5. Cultural Expressions

Strongly Recommended Courses: Canadian Studies 337, 339, 341, 361, 433, 439, 451.

Additional Courses: Art History 301, 303, 367, 411*; Canadian Studies 401*; Communication and Media Studies 435; English 372; Film 301*, 305*, 351, 403*, 405*, 441*, 451; History 341, 431.

6. Health and Social Policy

Strongly Recommended Courses: Canadian Studies 333, 355, 361.

Additional Courses: Anthropology 341, 441, 479, 589; Canadian Studies 401*; Economics 349, 379; Geography 463, 479; History 337, 442, 443, 450, Political Science 321, 357, 431, 447, 451, 521, 541; Sociology 205, 321, 355, 371, 373, 405, 409.

Additional Courses with a Focus on Canada

- Canadian Studies 201, 591
- Archaeology 303, 321, 423, 521
- Art 301
- Business and Environment 401
- Communication and Media Studies 201, 369, 371, 381, 383
- Communication and Culture 507, 509
- Development Studies 201
- Drama 355, 357
- Economics 201, 203, 321, 339, 365, 377, 401, 403, 431, 471, 475, 527
- English 371, 471, 473, 509
- Film 201
- French 209, 211, 213, 225, 227, 399.02, 439
- Geography 205, 341, 397.05, 421
- History 211, 213, 351, 435, 438, 451, 501, 520, 521, 525, 527, 531, 598
- Indigenous Studies 201, 303, 305, 311, 312, 399, 407, 502
- Law and Society 201

- Political Science 201, 343, 425, 426, 427, 428, 435, 523, 551
- Science, Technology and Society 201
- Sociology 303, 399
- Urban Studies 311, 313, 451, 461
- Women's Studies 201

Methodology Courses

- Communication and Media Studies 313, History 300, Political Science 399, Sociology 313.

Notes:

- Courses marked with an asterisks (*) can be counted with the approval of the Program Co-ordinator when the topic is appropriate. Other courses may be approved when their content is appropriate. In particular, additional English courses may be appropriate in Clusters 1, 4 and 5.
- A maximum of 6 units (1.0 full-course equivalent) may be used in language courses. Culture courses offered in English by language departments cannot be used toward language courses. Students should select a language of study that will assist them with their research on an understanding of Canadian Studies.
- Most of the courses listed above have prerequisites that lie outside the Field of Canadian Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

Field of Latin American Studies

The Field of Latin American Studies consists of the following courses:

Courses with a Focus on Latin America

All courses labelled Latin American Studies (LAST)

Anthropology 321, 421

Archaeology 341, 343, 345, 347, 351, 353, 355, 357, 411, 503*, 537, 553

Geography 371, 555*

History 365, 367, 467, 471, 472, 487, 565, 569

Political Science 473, 571*, 579*

Spanish 421, 423, 441*, 471*, 473*, 499*, 553, 555, 571*, 599*

Context Courses

Anthropology 405

Development Studies 375, 393, 405

Economics 337

Geography 425, 463

History 305

Indigenous Studies 312*, 399*, 407*

Music 301*

Political Science 279, 359

Supporting Courses

Communication and Culture 301, 303

Communication and Media Studies 313

History 300

Political Science 399

Psychology 312

Sociology 313

Notes:

- (*) Subject to approval by the Program Co-ordinator when focused on Latin American topics.
- Most of the courses listed above have prerequisites that lie outside the Field of Latin American Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

4.34.1 BA in History

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of History while fulfilling the following requirements:

1. *Practice of History*: History 300.

2. *Canadian History*: 6 units (1.0 full-course equivalent) in Canadian History (see note below).

3. *History before 1850*: 6 units (1.0 full-course equivalent) in history before 1850 (see note below).

4. *History Options*: An additional 27 units (4.5 full-course equivalents) from the Field of History.

5. *Upper-Year Courses*: Inclusive of the courses used to fulfill requirements 2-4 above, at least 12 units (2.0 full-course equivalents) must be at the 400 level and at least 6 units (1.0 full-course equivalent) must be at the 500 level. (History 591 may not be used to fulfill this requirement without the prior written consent of the Department).

6. Inclusive of the courses used in requirements 1-5 above, at least 6.0 full-course equivalents must be at the senior level.

C. DEGREE OPTIONS

The BA in History can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- History students are advised to take History 300 during their second year and must do so before taking any 500-level courses.
- The lists of courses that fulfill the requirements for Canadian History and History before 1850 are located before the History courses in the “Courses of Instruction” section of this calendar.
- Students are strongly advised not to wait until their last year to fulfill their 500-level course requirement, since enrolment in these courses is limited.
- The Department recommends that all History majors complete 6 units (1.0 full-course equivalent) at the 200 level.

4.34.2 BA Honours in History

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of History while fulfilling the following requirements:

1. *Practice of History*: History 300.

2. *Canadian History*: 6 units (1.0 full-course equivalent) in Canadian History (see note below).

3. *History before 1850*: 6 units (1.0 full-course equivalent) in history before 1850 (see note below).

4. *Honours Seminar, Readings and Essay*: History 496, 597 and 598.

5. *History Options*: An additional 27 units (4.5 full-course equivalents) from the Field of History.

6. *Upper-Year Courses*: Inclusive of the courses used to fulfill requirements 2-5 above, at least 12 units (2.0 full-course equivalents) must be at the 400 level and at least 12 units (2.0 full-course equivalents) must be at the 500 level. (History 597 and 598 may not be used to fulfill this requirement. History 591 may not be used to fulfill this requirement without the prior written consent of the Honours Advisor).

7. Inclusive of the courses used in requirements 1-6 above, at least 48 units (8.0 full-course equivalents) must be at the senior level.

C. OTHER REQUIREMENTS

Language Requirement: 12 units (2.0 full-course equivalents) in a language other than English relevant to a student’s studies.

D. DEGREE OPTIONS

The BA Honours in History can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- History students are advised to take History 300 during their second year and must do so before taking History 496 and any 500-level courses.
- History 496 is a 3 unit (0.5 full-course equivalent) course, normally completed in the third year, dealing predominantly with differing interpretations, theories and philosophies of History.
- The lists of courses that fulfill the requirements for Canadian History and history before 1850 are located before the History courses in the “Courses of Instruction” section of this calendar.
- History 597 is a 3-unit (0.5 full-course equivalent) directed reading course in their special field of interest, which is normally completed in the third year.

- In History 598 (6 units (1.0 full-course equivalent)) during the final year, under the supervision of one of the members of the Department, students write an Honours Essay using primary source materials. Students are also expected to participate in sessions throughout the year that will be facilitated by the Honours Advisor.
- In some situations it may be possible to demonstrate language proficiency by examination rather than course work.

4.34.3 Minor in History

The Minor in History is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of History with at least 18 units (3.0 full-course equivalents) at the 300 level or above. A minimum 3 units (0.5 full-course equivalent) must be at the 400 or 500 level.

Notes:

- It is strongly recommended that students with a Minor in History take History 300 in their second year of the program so that they may enrol in 500-level seminars, for which it is a requirement.
- Greek and Roman Studies courses cannot count toward a Minor in History.

4.34.4 BA in Canadian Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Canadian Studies while fulfilling the following requirements:

1. *Core Courses:* 6 units (1.0 full-course equivalent) from Canadian Studies 201, 591.

2. *Research Methods Requirement:* 3 units (0.5 full-course equivalent) from Communication and Media Studies 313, History 300, Political Science 399 or Sociology 313.

3. *Thematic Clusters:* 24 units (4.0 full-course equivalents) from two thematic clusters within the Field of Canadian Studies with at least 12 units (2.0 full-course equivalents) in each cluster.

4. *Canadian Content Options*: an additional 15 units (2.5 full-course equivalents) from the Field of Canadian Studies.

5. *Depth in Canadian Studies*: Inclusive of Canadian Studies 591 and the courses used to fulfill requirements 3 and 4, at least 12 units (2.0 full-course equivalents) at the 400 level or above from the Field of Canadian Studies.

C. DEGREE OPTIONS

The BA in Canadian Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- It is suggested first-year Canadian Studies Majors select Canadian Studies 201 and at least 9 units (1.5 full-course equivalents) from among the following courses: History 211 or 213; Political Science 201; Sociology 205; Geography 205; Indigenous Studies 201; Film 201; Economics 201, 203; Law and Society 201; Development Studies 201; Science, Technology and Society 201.
- A maximum of 6 units (1.0 full-course equivalent) may be used in language courses. Culture courses offered in English by language departments cannot be used toward language courses. Students should select a language of study that will assist them with their research on an understanding of Canadian Studies. Students are strongly advised to take language courses in French and Indigenous Languages to complement their programs.
- It is strongly recommended that students take at least 9 units (1.5 full-course equivalents) in courses labelled Canadian Studies because these courses adopt an explicitly interdisciplinary approach. These courses should normally be chosen from the student's thematic clusters in 4.34.

4.34.5 BA Honours Canadian Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Canadian Studies while fulfilling the following requirements:

1. Core Courses: 6 units (1.0 full-course equivalent) from Canadian Studies 201, 591.

2. Research Methods Requirement: 3 units (0.5 full-course equivalent) from Communication and Media Studies 313, History 300, Political Science 399 or Sociology 313.

3. Thematic Clusters: 24 units (4.0 full-course equivalents) from two thematic clusters within the Field of Canadian Studies with at least 12 units (2.0 full-course equivalents) in each cluster.

4. Canadian Content Options: an additional 15 units (2.5 full-course equivalents) from the Field of Canadian Studies.

5. Undergraduate Honours Thesis: History 598.

6. Depth in Canadian Studies: Inclusive of Canadian Studies 591 and the courses used to fulfill requirements 3 and 4, at least 12 units (2.0 full-course equivalents) at the 400 level or above from the Field of Canadian Studies.

C. DEGREE OPTIONS

The BA Honours in Canadian Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- It is suggested first-year Canadian Studies Majors who are considering the Honours Program select Canadian Studies 201 and at least 12 units (2.0 full-course equivalents) from among the following courses: History 211 or 213; Political Science 201; Sociology 205; Geography 205; Indigenous Studies 201; Film 201; Economics 201, 203; Law and Society 201; Development Studies 201; Science, Technology and Society 201.
- A maximum of 6 units (1.0 full-course equivalent) may be used in language courses. Culture courses offered in English by language departments cannot be used toward language courses. Students should select a language of study that will assist them with their research on an understanding of Canadian Studies. Students are strongly advised to take language courses in French and Indigenous Languages to complement their programs.
- It is strongly recommended that students take at least 9 units (1.5 full-course equivalents) in courses labelled Canadian Studies because these courses adopt an explicitly interdisciplinary approach. These courses should normally be chosen from the student's thematic clusters in 4.34.

4.34.6 Minor in Canadian Studies

The Minor in Canadian Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Canadian Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The Canadian Studies Minor also requires:

1. Canadian Studies 201 and an additional 9 units (1.5 full-course equivalents) in courses labelled Canadian Studies.

2. An additional 18 units (3.0 full-course equivalents) from the Thematic Clusters and Additional Courses with a Focus on Canada from within the Field of Canadian Studies.

Note: It is suggested first-year Canadian Studies Minors select Canadian Studies 201 and at least 6 units (1.0 full-course equivalent) from among the following courses: History 211 or 213; Political Science 201; Sociology 205; Geography 205; Indigenous Studies 201; Film 201; Economics 201, 203; Law and Society 201; Development Studies 201; Science, Technology and Society 201.

4.34.7 BA in Latin American Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) in the Field of Latin American Studies while fulfilling the following requirements:

1. *Core Courses:* 9 units (1.5 full-course equivalents) Latin American Studies 211, 311, 401

2. *Research Methodology:* 3 units (0.5 full-course equivalent) chosen from Communication and Media Studies 313, History 300, Political Science 399, Psychology 312, Sociology 313

3. *Seminar or Research Course:* 3 units (0.5 full-course equivalent) chosen from Archaeology 503*, 537, 553; Geography 555*; History 565, 569; Latin American Studies 501; Political Science 571*, 579*; Spanish 553, 555, 571*, 599*. (*Subject to approval by the Program Co-ordinator when focused on Latin American topics).

4. *Latin American Studies Options:* 27 units (4.5 full-course equivalents) from the field of Latin American Studies including at least 21 units (3.5 full-course equivalents) chosen from the list of "Courses with a Focus on Latin America"

C. Other Requirements

Language: Successful completion of Spanish 303 or demonstration of proficiency to that level in Spanish or Portuguese as approved by the Department of French, Italian and Spanish.

D. Degree Options

The BA in Latin American Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students who fulfill the minimum language requirement prior to entering the University are strongly urged to take additional courses in Spanish to improve their language skills.
- In choosing their Latin American Studies options, it is strongly recommended that students include at least 6 units (1.0 full-course equivalent) from each of two disciplines.

4.34.8 Minor in Latin American Studies

The Minor in Latin American Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units 6.0 full-course equivalents) from the Field of Latin American Studies as detailed below:

1. Latin American Studies 211, 311, 401.

2. An additional 21 units (3.5 full-course equivalents) from the two lists: Courses with a Focus on Latin America and Context Courses found within the Field of Latin American Studies.

Notes:

- The Supporting Courses, Communication and Culture 301, 303, Communication and Media Studies 313, History 300, Political Science 399, Psychology 312 and Sociology 313 may not be counted toward the minor in Latin American Studies.
- In addition to the requirements for the minor, students should realize that competence in Spanish and/or Portuguese is highly desirable particularly if they intend to embark on field work in Latin America.

4.35 History and Philosophy of Science

Note: Applications to the BA and BA Honours program are currently suspended. No new admissions will be permitted. The Minor in History and Philosophy of Science is still available. Students currently in the History and Philosophy of Science BA or Honours program should consult with the Arts Students' Centre for program advice.

Overview of Programs and Procedures

Baccalaureate Degrees Offered

A Minor Field of Specialization is offered in History and Philosophy of Science.

Contact Information

Website: phil.ucalgary.ca/undergrad/hps.

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Overlapping Programs

Programs in History and Philosophy of Science programs cannot be taken in conjunction with programs in Philosophy. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees. A maximum of 60 units (10.0 full-course equivalents) is allowed in any discipline within the Major Field of History and Philosophy of Science.

Programs in the History and Philosophy of Science can be taken in conjunction with programs in History with approval from the Faculty. Consent is required for Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of History and Philosophy of Science

The Field of the History and Philosophy of Science consists of the following courses:

- History 372, 427, 477.01, 477.02, 541, 597 and 598
- Philosophy 279, 301, 303, 305, 307, 309, 361, 367, 377, 379, 405, 407, 467, 479, 501, 505, 507, 517, 565, 567, 571, 590 and 595
- Anthropology 461
- Computer Science 409
- Economics 483
- English 393
- Greek and Roman Studies 321
- Psychology 305
- Religious Studies 397
- Science, Technology and Society 327

Notes:

- Most of the courses listed above have prerequisites that lie outside the Field of the History and Philosophy of Science. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.
- History 541 is a decimalized course and may be repeated for credit.

4.35.1 BA in History and Philosophy of Science

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of History of Philosophy of Science while fulfilling the following requirements:

1. *History of Science:* 12 units (2.0 full-course equivalents) from: History 371, 373, 477.01, 477.02, 541 (decimalized course, may be repeated for credit).

2. *Philosophy of Science:* 9 units (1.5 full-course equivalents) from: Philosophy 367, 467, 517, 565, 567.

3. *Logic:* 3 units (0.5 full-course equivalent) from: Philosophy 279, 377. (This requirement should be satisfied early in the program.)

4. *Philosophy:* An additional 12 units (2.0 full-course equivalents) in Philosophy:

(a) With at least 6 units (1.0 full-course equivalent) from: Philosophy 301, 303, 305, 307, 309, 311, 401, 403, 405, 407, 501, 505, 507.

The remaining 6 units (1.0 full-course equivalent) in Philosophy may be taken from the above list, or from the following:

(b) Philosophy 361, 379, 471, 473, 479, 571.

5. *Research Seminar:* Philosophy 517 or 595. The particular section of Philosophy 595 taken must be approved by the HPSC advisor.

Note: A course taken to fulfil this requirement may not also be used to fulfil requirement 2.

6. *History and Philosophy of Science Options:* An additional 9 units (1.5 full-course equivalents) from the Field of the History and Philosophy of Science.

C. OTHER REQUIREMENTS

1. *Science Requirement:* 18 units (3.0 full-course equivalents) from the Faculty of Science or from other courses within the Domain of Science (see 4.14.11) with at least 6 units (1.0 full-course equivalent) at the 400 level or above.

2. *Language Requirement:* 6 units (1.0 full-course equivalent) in a language other than English.

3. At least 12 units (2.0 full-course equivalents) of the 48 units (8.0 full-course equivalents) required for a Major must be completed at the 400 level or above.

D. DEGREE OPTIONS

The BA in History and Philosophy of Science can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- History 201 and Philosophy 201 are recommended but are not part of the Major Field.
- Philosophy 517 can be repeated for credit. If a student only takes it once, it cannot be used to count toward satisfying Requirement 2.
- It is recommended that students include 6 units (1.0 full-course equivalent) in Mathematics as well as 6 units (1.0 full-course equivalent) in another Science in first year.
- Students may find the following courses of interest: Science, Technology and Society 201, 325, 591.
- For the "Science Requirement," some courses in Archaeology, Biology, Chemistry, Computer Science, Geography, Geology and Geophysics, and Psychology are restricted to majors in those programs or have other enrolment restrictions applied to them. History and Philosophy of Science majors wishing to take restricted courses in these programs may find it advantageous to be registered in a combined degree with a major in the relevant program.
- For the "Science Requirement," fulfilling all the prerequisites for some 400-level courses in some programs will require the completion of more than 18 units (3.0 full-course equivalents). Please consult this Calendar and the Schedule of Classes for course prerequisites and restrictions.

4.35.2 BA Honours in History and Philosophy of Science

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of History of Philosophy of Science while fulfilling the following requirements:

1. *History of Science:* 12 units (2.0 full-course equivalents) from: History 371, 373, 477.01, 477.02, 541 (decimalized course, may be repeated for credit).

2. *Philosophy of Science:* 9 units (1.5 full-course equivalents) from: Philosophy 367, 467, 517, 565, 567.

3. *Logic:* 3 units (0.5 full-course equivalent) from: Philosophy 279, 377. (This requirement should be satisfied early in the program.)

4. *Philosophy:* An additional 12 units (2.0 full-course equivalents) in Philosophy:

(a) With at least 6 units (1.0 full-course equivalent) from: Philosophy 301, 303, 305, 307, 309, 311, 401, 403, 405, 407, 501, 505, 507.

AND

(b) Philosophy 379 and one of: Philosophy 361, 471, 473, 479, 571 (or one 3-unit (half course) from the above list).

5. *Research Seminar:* Philosophy 517 or 595. The particular section of Philosophy 595 taken must be approved by the HPSC advisor.

Note: A course taken to fulfil this requirement may not also be used to fulfil requirement 2 or 7.

6. *History and Philosophy of Science Options:* An additional 9 units (1.5 full-course equivalents) from the Field of the History and Philosophy of Science.

7. *Directed Readings:* Philosophy 595 or History 597.

8. *Honours Thesis:* Philosophy 590 or History 598.

9. *Capstone:* An additional 3 units (0.5 full-course equivalent) from the Field of History and Philosophy of Science at the 500 level.

C. OTHER REQUIREMENTS

1. *Science Requirement: 18* units (3.0 full-course equivalents) from the Faculty of Science or from other courses within the Domain of Science (see in 4.14.11) with at least 6 units (1.0 full-course equivalent) at the 400 level or above.

2. *Language Requirement: 6* units (1.0 full-course equivalent) in a language other than English.

D. DEGREE OPTIONS

The BA Honours in History and Philosophy of Science can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- History 201 and Philosophy 201 are recommended but are not part of the Major Field.
- Philosophy 517 and 595 may be repeated for credit. If either course is taken only once, it cannot also be used to count toward satisfying Requirement 2 and/or 7.
- Students may find the following courses of interest for their open options or Faculty of Arts options: Science, Technology and Society 201, 325, 591.
- For the "Science Requirement," some courses in Archaeology, Biology, Chemistry, Computer Science, Geography, Geology and Geophysics, and Psychology are restricted to majors in those programs or have other enrolment restrictions applied to them. History and Philosophy of Science majors wishing to take restricted courses in these programs may find it advantageous to be registered in a combined degree with a major in the relevant program.
- For the "Science Requirement," fulfilling all the prerequisites for some 400-level courses in some programs will require the completion of more than 18 units (3.0 full-course equivalents). Please consult this Calendar and the Schedule of Classes for course prerequisites and restrictions.

4.35.3 Minor in the History and Philosophy of Science

The Minor in History and Philosophy of Science is aimed in the first instance at students in the BSc Programs in the Faculty of Science, the Schulich School of Engineering and the Faculty of Arts. This Minor complements disciplinary studies in the sciences with the study of the historical and philosophical background and foundation of the sciences.

The Minor in the History and Philosophy of Science is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of the History and Philosophy of Science, including:

1. *History of Science:* 6 units (1.0 full-course equivalent) from: History 371, 373, 477.01, 477.02 and 541 (decimalized course, may be repeated for credit).

2. *Philosophy of Science:* 6 units (1.0 full-course equivalent) from: Philosophy 367, 467, 517, 565 and 567.

3. At least 3 units (0.5 full-course equivalent) must be at the 400 level or above.

4.36 Indigenous Studies

See International Indigenous Studies

4.37 International Indigenous Studies

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Degrees in International Indigenous Studies

Bachelor of Arts (BA) in International Indigenous Studies

BA in International Indigenous Studies with Co-operative Education

Note: A Minor is offered in International Indigenous Studies.

Introduction

The Faculty of Arts offers an interdisciplinary major in International Indigenous Studies. Students must carefully select their courses to meet the requirements of this degree and they should consult with the Program Co-ordinator of the International Indigenous Studies program before selecting courses. Entry to the program in the first year is recommended.

There is also a Minor program available in International Indigenous Studies, but not an Honours program.

Contact Information

Program Co-ordinator:
indgprog@ucalgary.ca

Website: idp.ucalgary.ca/indg

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Program Co-ordinator (consult the program website for contact information).

Admission to the Major

Prospective students wishing to enter the BA International Indigenous Studies Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in the A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

First Nations, Métis, Inuit and other prospective students are encouraged to apply. The University of Calgary is committed to providing equitable access and participation of Aboriginal people in all its faculties, programs and services. Please see the section of the Calendar on A.8 Aboriginal Admission Process.

Field of International Indigenous Studies

The Field of International Indigenous Studies consists of the following courses:

Core Courses: Anthropology 213; Development Studies 201; History 345; Indigenous Studies 201, 303, 305, 407, 415; Indigenous Languages 205; Sociology 307.

Canadian Focus: Archaeology 419, 423; Art History 367; Development Studies 403; Economics 339; English 385; History 443, 529; Indigenous Studies 311, 312, 317, 343, 397, 401, 502; Linguistics 505; Law and Society 335; Political Science 321, 343, 424; Sociology 307, 421*, 475*.

International Focus: African Studies 301, 400, 501; Anthropology 317, 319, 321, 355, 357, 405, 421; Archaeology 341, 343, 345, 351, 353, 355, 357, 553; Art History 367; Development Studies 393, 485; Economics 337; English 493; History 303, 439, 461, 467; Indigenous Studies 399, 503*; Latin American Studies 311; Linguistics 531; Political Science 279, 371, 381, 471, 473, 579; Psychology 491; Religious Studies 339.

**Will be accepted when the topic is appropriate. Obtaining approval from the Program Co-ordinator will be required.*

Notes:

- Most of the courses listed above have prerequisites that lie outside the Field of International Indigenous Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.
- Special topics courses may be approved and categorized by the Program Co-ordinator. There are a large number of relevant topics courses offered by departments and programs inside and outside the Faculty of Arts that may require approval.
- Indigenous Languages 205 is a language course required for the BA in International Indigenous Studies.

4.37.1 BA in International Indigenous Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) in the Field of International Indigenous Studies while fulfilling the following requirements:

1. *Core Courses:* 21 units (3.5 full-course equivalents) including:

(a) Indigenous Studies 201, 303, 305, 407, and 415;

(b) 6 units (1.0 full-course equivalent) from: Anthropology 213, Development Studies 201, History 345 or Sociology 307;

2. *Supporting Courses:* An additional 27 units (4.5 full-course equivalents) from the Field of International Indigenous Studies, of which:

(a) 6 units (1.0 full-course equivalents) must have a "Canadian Focus" and

(b) 9 units (1.5 full-course equivalents) must have an "International Focus;"

(c) At least 6 units (1.0 full-course equivalent) of the supporting courses must be at the 400 level or above.

C. OTHER REQUIREMENTS

Language Requirement: Indigenous Languages 205.

D. DEGREE OPTIONS

The BA in International Indigenous Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students should pay close attention to the timetable and when courses are offered, as some courses are offered only in Block Week during specific terms, or only in either Spring or Summer Intersession.
- Indigenous Studies courses at the 200 level should be taken before second year, if at all possible.
- Indigenous Studies 407 is normally taken in the final year.

4.37.2 Minor in International Indigenous Studies

The Minor in International Indigenous Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of International Indigenous Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The International Indigenous Studies Minor also requires:

1. *Core Courses:* Indigenous Studies 201 and 407.

2. *Supporting Courses:* An additional 24 units (4.0 full-course equivalents) from the Field of International Indigenous Studies.

4.38 International Relations

See Political Science.

4.39 Italian Studies

See French, Italian and Spanish

4.40 Japanese

See Linguistics, Languages, and Culture.

4.41 Latin

See Greek and Roman Studies.

4.42 Latin American Studies

See History.

4.43 Law and Society

See Sociology.

4.44 Linguistics

See Linguistics, Languages, and Culture.

4.45 Linguistics and Language

Overview of Programs and Procedures in Linguistics and Language

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Linguistics and Language

BA in Linguistics and Language with Co-operative Education

Introduction

The Major in Linguistics and Language incorporates the study of linguistics with a language other than English. The following departments jointly offer the Major:

- French, Italian and Spanish
- Classics and Religion (Classical Hebrew, Classical Chinese, Greek, Latin, Sanskrit, Tibetan)
- Linguistics, Languages, and Cultures (German, Russian, Chinese, Japanese, Linguistics)

There is no Minor or Honours program in Linguistics and Language. For information on this program consult the Undergraduate Advisor for Linguistics.

Contact Information

Undergraduate Advisor: R. Murray

Department Office: Social Sciences 824

Phone: 403.220.8109

Fax: 403.282.3880

Email: lingadv@ucalgary.ca

Website: ling.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Linguistics and Language) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Overlapping Programs

Programs in Linguistics and Language cannot be taken in conjunction with programs in Linguistics or in the chosen Language Option. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

A Linguistics major may not be combined with both the Minor and the Concentration in Speech-Language Sciences.

Field of Linguistics and Language

Students in this program select a particular language option (e.g., French or German or Russian, etc.). Students are not permitted to mix their languages except in the Ancient and Classical Languages option.

The Field of Linguistics and Language consists of all courses labelled Linguistics (LING) and all courses in the chosen language.

4.45.1 BA in Linguistics and Language

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

1. *Linguistics Requirements:* Students must successfully complete a minimum of 24 units (4.0 full-course equivalents) and a maximum of 30 units (5.0 full-course equivalents) in Linguistics and fulfill the following requirements:

(a) Linguistics 201, 301, 303, 341, and 353.

(b) 3 units (0.5 full-course equivalent) from: Linguistics 319, 407 and 455.

(c) An additional 6 units (1.0 full-course equivalent) in Linguistics.

(d) At least 6 units (1.0 full-course equivalent), inclusive of the courses used to fulfill requirements (a)-(c) above, must be at the 400 level or above.

2. *Language Requirements:* Students must successfully complete a minimum of 24 units (4.0 full-course equivalents) and a maximum of 30 units (5.0 full-course equivalents) in accordance with the requirements for one of the following language options:

French Option: A program of study including French 329 or 415 and at least an additional 6 units (1.0 full-course equivalent) at the 400 and/or 500 level, of which one must be in literature. French 489.01 is strongly recommended when available.

Spanish Option: A program of study including Spanish 405 and at least an additional 6 units (1.0 full-course equivalent) at the 400 and/or 500 level, of which one must be in literature. Spanish 475 is strongly recommended when available.

Italian Option: A program of study including at least 6 units (1.0 full-course equivalent) at the 400 and/or 500 level.

German Option: A program of study including German 413 and 415 and at least an additional 3 units (0.5 full-course equivalent) at the 400 or 500 level.

Russian Option: A program of study including Russian 333 and at least 6 units (1.0 full-course equivalent) at the 400 and/or 500 level.

Japanese Option: A program of study including Japanese 333 and at least 6 units (1.0 full-course equivalent) at the 400 and/or 500 level.

Chinese Option: A program of study including Chinese 333 and at least 6 units (1.0 full-course equivalent) at the 400 and/or 500 level.

Ancient and Classical Languages Option: From the courses listed below, a program of study in a maximum of two languages, students must successfully complete a minimum of 24 units (4.0 full-course equivalents) and a maximum of 30 units (5.0 full-course equivalents), including a minimum of 3 units (0.5 full-course equivalent) at the 400 or 500 level.

- Greek Language: Greek 201, 203, 301, 303, 401, 403 and 551
- Latin Language: Latin 201, 203, 205, 207, 301, 303, 401, 403 and 551
- Hebrew Language: Religious Studies 300, 302, and 491*
- Sanskrit Language: Religious Studies 310, 312, and 491*
- Tibetan Language: Religious Studies 314, 316, and 491*
- Classical Chinese: Religious Studies 320, 322, and 491*

**Applicable only when the content of the course is appropriate.*

C. DEGREE OPTIONS

The BA in Linguistics and Language can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- It is recommended that students who are interested in language teaching take Linguistics 311 and 313.
- Students are also encouraged to consider a study abroad program to gain international experience and improve language exposure.
- For each language option, it is strongly recommended that students choose their program of study and course sequence in consultation with the appropriate language Advisor.
- Students choosing the French option and beginning in French 213 should be aware that 30 units (5.0 full-course equivalents) will normally be required to complete the French option requirements.
- Romance Studies 399 may be used to satisfy part of this requirement in lieu of a language course in the French, Spanish or Italian options.
- Careful attention is needed to meet the specified course and 400-level requirements within the particular language option.

4.46 Linguistics, Languages, and Culture

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Degrees in East Asian Language Studies

Bachelor of Arts (BA) in East Asian Language Studies

BA in East Asian Language Studies with Co-operative Education

Degrees in East Asian Studies

Bachelor of Arts (BA) in East Asian Studies

BA in East Asian Studies with Co-operative Education

Degrees in German

BA in German

BA in German with Co-operative Education

BA Honours in German

BA Honours in German with Co-operative Education

Degrees in Linguistics

BA in Linguistics

BA in Linguistics with Co-operative Education

BA Honours in Linguistics

BA Honours in Linguistics with Co-operative Education

Related Interdisciplinary Degrees (See separate listings)

BA in Linguistics and Language

BA in Linguistics and Language with Co-operative Education

Degrees in Russian

BA in Russian

BA in Russian with Co-operative Education

BA Honours in Russian

BA Honours in Russian with Co-operative Education

Notes:

- Minors are offered in Chinese, East Asian Studies, German, Japanese, Linguistics, and Russian. A Minor in Speech-Language Sciences is also offered to students with a declared Major in either Linguistics or Psychology.

- Concentrations are offered in Applied Linguistics and Speech-Language Sciences to students with a declared Major in Linguistics.

Introduction

I. The Department of Linguistics, Languages, and Cultures offers courses in the core areas of Linguistics and in specific focal areas including: (1) linguistic analysis and theory (phonology, morphology, syntax and semantics); (2) articulatory and acoustic phonetics; (3) historical linguistics (including courses on the history of English and Indo-European); (4) language acquisition (both first and second); (5) the analysis of Indigenous languages of Canada; (6) and psycholinguistics. Occasionally the Department offers courses dealing with the structures of particular (usually non-Indo-European) languages.

The Major in Linguistics is designed to provide students with foundational and advanced training in the core and specific focal areas of the discipline. Students can also pursue Concentrations in Applied Linguistics or Speech-Language Sciences. Students interested in these Concentrations should consult with the Undergraduate Advisor as early as possible in their program so that a specific degree (Major/Minor, Double Major) and sequence of courses can be selected in accordance with the student's interests and goals and the requirements of the various programs and courses.

Any student who has declared a Linguistics Major is eligible to declare a Concentration in either Applied Linguistics or Speech-Language Sciences.

II. The Department of Linguistics, Languages, and Cultures offers instruction with an intercultural focus in the fields of Arabic, Chinese, East Asian Studies, German, Japanese, and Russian, as well as a course in Slavic Studies.

Students should begin their language studies by choosing a first course at a level corresponding to their previous knowledge of the subject. Those with no previous instruction normally begin with Arabic 202, Chinese 205, German 202, Japanese 205, or Russian 201. Those with German 30 or Russian 30 should enrol in German 331 or Russian 301 respectively. In cases of doubt, students should seek the advice of the Department and are generally encouraged to do so at all stages of the program of study.

East Asian Studies is an interdisciplinary area that includes a BA in East Asian Studies and a Minor in East Asian Studies. These programs are designed for students with an interdisciplinary interest in East Asia. Career opportunities for graduates of this program exist in government departments, the diplomatic services or private corporations with business concerns in the area.

Students may wish to consider undertaking a double Major with a disciplinary subject such as Political Science or Philosophy, especially if they are contemplating proceeding to graduate work. Combinations with other interdisciplinary majors could well be considered also.

Advanced Placement

Students who have prior knowledge of Arabic, Chinese, German, Japanese, or Russian, as well as students with more than high-school matriculation in these languages must consult the Department to be placed in a course corresponding to their ability. Enrolment in Arabic and Chinese language courses involves a formal placement process. See details under Courses of Instruction, Arabic and Muslim Cultures and Chinese.

Students seeking credit by special assessment should consult the Department regarding courses available for credit in this manner.

Native speakers are not eligible to take language courses by special assessment.

Notes:

- The Department can refuse permission to remain in a particular language course if the instructor deems that the student's knowledge exceeds the level of that course.
- Students are advised that misrepresenting their level of knowledge in the language of the course constitutes academic dishonesty and will be dealt with as such.

Contact Information

Office Location: Craigie Hall C205

Phone: 403.220.5293

Fax: 403.284.3810

Email: llc@ucalgary.ca

Website: llc.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the Department of Linguistics, Languages and Cultures (consult Department website for contact information).

Admission to the Majors

Prospective students wishing to enter one of the BA programs offered by the Department of Linguistics, Languages, and Cultures must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Upon admission to the East Asian Studies Major, students are strongly advised to develop a schedule of courses in consultation with the Department.

Admission to Honours in German, Linguistics, and Russian

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 "Honours Degrees with a Major Field" are applicable and provide the overall framework for entry into the Honours Programs in German, Linguistics, and Russian. The application deadline is February 1.

Overlapping Programs

Programs in East Asian Language Studies cannot be taken in conjunction with programs in East Asian Studies. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees. Students cannot combine the East Asian Language Studies major with either a Chinese or Japanese minor.

Programs in Linguistics cannot be taken in conjunction with the program in Linguistics and Language. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

A Linguistics major may not be combined with both the Minor and the Concentration in Speech-Language Sciences.

Language programs (i.e., majors or minors) offered by the Department of Linguistics, Languages and Cultures can only be taken in conjunction with the major program in Linguistics and Language if the language or languages in the former program differ from the chosen Language Option for the latter. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of East Asian Language Studies

The Field of East Asian Language Studies consists of the following categories and courses:

Chinese Language: Chinese 205, 207, 229, 279, 301, 303, 311, 313, 331, 333, 341, 353, 401, 403, 431, 561.

Japanese Language: Japanese 205, 207, 301, 303, 311, 313, 331, 333, 441, 451.

Chinese Studies: Chinese 309, 317, 341, 353, 355, 357, 431, 461, 561.

Japanese Studies: Art History 365; Japanese 309, 317, 341, 461; Strategy and Global Management 573.

Capstone: East Asian Language Studies 501.

Subject to department approval, courses in Chinese Studies and Japanese Studies from other disciplines will be credited towards a degree.

Note: Most of the courses listed above have prerequisites that lie outside the Field of East Asian Language Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

Field of East Asian Studies

The Field of East Asian Studies consists of the following courses:

Courses with a focus on East Asia

- Anthropology 303* 323, 427
- Art History 325, 365
- Chinese 309, 311, 313, 317, 341, 353, 355, 357, 431, 461, 561

- East Asian Studies 201, 319, 321, 331, 333, 499, 531
- History 209, 317, 404, 406, 547
- Japanese 309, 311, 313, 317, 341, 461
- Philosophy 335
- Political Science 465, 501*
- Religious Studies 203, 313, 323, 327, 329, 359, 453, 491*, 595*
- Strategy and Global Management 573

When topic is applicable to East Asia.

Language Courses

- Chinese 205, 207, 229, 279, 301, 303, 311, 313, 331, 333, 341, 401, 403, 431, 561
- Japanese 205, 207, 301, 303, 311, 313, 331, 333, 441, 451

Supporting Courses

- Anthropology 203
- Communication and Culture 301, 303
- Geography 251
- Linguistics 201
- Philosophy 201
- Political Science 201
- Religious Studies 205
- Sociology 201

Field of German

The Field of German consists of all courses labelled German (GERM).

Field of Linguistics

The Field of Linguistics consists of all courses labelled Linguistics (LING), except Linguistics 321.

Field of Russian

The Field of Russian consists of all courses labelled Russian (RUSS) and Slavic 355.

4.46.1 BA in East Asian Language Studies

Eligibility

Students who receive advanced placement at the 331 level or higher in both Chinese and Japanese are ineligible for this program. Students who receive advanced placement in either Chinese or Japanese at the 331 level or higher must choose the language in which they have not received advanced placement as their primary language of study and the language in which they do have advanced placement as their secondary language of study.

Requirements

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students majoring in East Asian Language Studies choose either Chinese or Japanese as the primary language of study and the other as their secondary language of study.

Students must successfully complete a minimum of 51 units (8.5 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of East Asian Language Studies while fulfilling the following requirements:

1. *Primary Language of Study:* 24 units (4.0 full-course equivalents) from the list of either "Chinese Language" or "Japanese Language" courses, whichever is the primary language of study. (See the description under Major Field in East Asian Language Studies).

2. *Secondary Language of Study:* 12 units (2.0 full-course equivalents) from the list of either "Japanese Language" or "Chinese Language" courses, whichever is the secondary language of study. (This will be the language not chosen for Requirement 1 above.)

3. *Primary Area of Studies*: 9 units (1.5 full-course equivalents) from the list of either "Chinese Studies" or "Japanese Studies" courses, whichever corresponds to the primary language of study.

4. *Secondary Area of Studies: 3* units (0.5 full-course equivalent) from the list of either "Japanese Studies" or "Chinese Studies" courses, whichever corresponds to the secondary language of study.

5. *Capstone:* East Asian Language Studies 501.

C. DEGREE OPTIONS

The BA in East Asian Language Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students who have received advanced placement in the second language may take up to 6 units (1.0 full-course equivalent) in the first language in place of 6 units (1.0 full-course equivalent) in the second language.
- In the final year, students take East Asian Language Studies 501: Topics in East Asian Language Studies. This course allows students to synthesize their training in East Asian languages and cultures and bring it to bear on a particular issue in the two languages, and/or the relation between the languages and the cultures.

4.46.2 Minor in Chinese

The Minor in Chinese is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in "Chinese Language" and "Chinese Studies" courses (see the Field of East Asian Language Studies). Chinese 333 is required.

Subject to Departmental approval, a maximum of 6 units (1.0 full-course equivalent) from Chinese Studies in a different discipline may be credited towards a degree.

4.46.3 Minor in Japanese

The Minor in Japanese is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in "Japanese Language" and "Japanese Studies" courses (see the Field of East Asian Language Studies).

Note: Students entering the Japanese language program at a level higher than Japanese 303 may complete the Minor with additional courses from other disciplines by consent of the Department.

4.46.4 BA in East Asian Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) in the field of East Asian Studies and fulfill the following requirements:

1. *Core Courses*: East Asian Studies 331, 531, and either East Asian Studies 333 or Japanese 317.

2. *Methods and Frameworks*:

(a) 3 units (0.5 full-course equivalent) from: Philosophy 201 or Religious Studies 205;

(b) 3 units (0.5 full-course equivalent) from: Anthropology 203, Geography 251, Linguistics 201, Political Science 201 or Sociology 201.

3. *Language*: 12 units (2.0 full-course equivalents) from either: (a) Chinese 205, 207, 229, 279, 301, 303, 311, 313, 331, 333, 341, 401, 403, 431, 561; or (b) Japanese 205, 207, 301, 303, 311, 313, 331, 333, 441, 451.

4. *East Asian Studies Options*: an additional 21 units (3.5 full-course equivalents) chosen from within the Field of East Asian Studies with at least 15 units (2.5 full-course equivalents) chosen from the list of courses with a Focus on East Asia. East Asian Studies 201 is strongly recommended.

C. DEGREE OPTIONS

The BA in East Asian Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: To help understand the differences between East Asian societies and "Western" societies, it is recommended that students include Communication and Culture 301 and 303 in their "East Asian Options" (item 4).

4.46.5 Minor in East Asian Studies

The Minor in East Asian Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) from the Field of East Asian Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The East Asian Studies Minor also requires:

1. East Asian Studies 331 and either East Asian Studies 333 or Japanese 317.

2. *Language*: 6 units (1.0 full-course equivalent) from language courses in the Field of East Asian Studies from either: (a) Chinese 205, 207, 229, 279, 301, 303, 311, 313, 331, 333, 341, 401, 403, 431, 561; or (b) Japa-

nese 205, 207, 301, 303, 311, 313, 331, 333, 441, 451.

3. At least 18 units (3.0 full-course equivalents) chosen from the Field of East Asian Studies with at least 12 units (2.0 full-course equivalents) from list of courses with a Focus on East Asia. East Asian Studies 201 is strongly recommended.

Note: Some of the courses listed have prerequisites. It is the student's responsibility to ensure that prerequisites are completed.

4.46.6 BA in German

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of German while fulfilling the following requirements:

1. *Core Courses:* German 349 or 353, and German 501 and 503.

2. *German Options:* An additional 39 units (6.5 full-course equivalents) from the Field of German.

C. DEGREE OPTIONS

The BA in German can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Upon admission to the Major in German each student will be assigned a departmental advisor who will assist with program planning and course selection.
- Students with no German should begin with the sequence of German 202, 204, 331, 333, 349 or 353 413, 415, and 501, 503.
- Students with German 30 should begin with the sequence German 331, 333, 349 or 353, 413, 415, and 501, 503.
- Students who have some German but do not have German 30 must consult with the Department to determine placement.
- German 357 and 359 are delivered in English and may be repeated for credit. However, a maximum of 6 units (1.0 full-course equivalents) of German 357 and/or 359 may be credited towards a degree.
- A maximum of 6 units (1.0 full-course equivalents) from German studies in a different discipline, subject to Department approval, may be credited towards a degree.

4.46.7 BA Honours German

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of German while fulfilling the following requirements:

1. *Core Courses:* German 349 or 353; 501 and 503.

2. *Honours Thesis:* German 591.

3. *German Options:* An additional 42 units (7.0 full-course equivalents) from the Field of German.

C. DEGREE OPTIONS

The BA Honours German can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students interested in applying for Honours should discuss their plans with and seek the advice of the Undergraduate Director. Upon admission each student will be assigned a departmental advisor who will assist with program planning and course selection, and the designation of the thesis supervisor.
- It is strongly recommended that students develop a supporting area of focus consisting of at least 12 units (2.0 full-course equivalents) in a closely related Field (such as History 413).
- Students will find it to their advantage to have background in one or more of the following Fields: Comparative Literature, English, Greek and Roman Studies, History, Linguistics, Philosophy and Romance Languages.
- German 357 and 359 are delivered in English and may be repeated for credit. However, a maximum of 6 units (1.0 full-course equivalents) of German 357 and/or 359 and a maximum of 6 units (1.0 full-course equivalents) from German studies in a different discipline, subject to Departmental approval, may be credited towards a degree.
- In the final year the student must take German 591 (Honours Project). This will require the preparation of an Honours Thesis under close departmental supervision.

4.46.8 Minor in German

The Minor in German is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete between 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in courses labelled German, including at least 18 units (3.0 full-course equivalents) at the senior level. The following courses are required: either German 413 or 415, and either German 349 or 353.

Notes:

- German 357 and 359 are delivered in English and may be repeated for credit. However, a maximum of 6 units (1.0 full-course equivalent) of German 357 and/or 359 may be credited towards a degree.
- A maximum of 6 units (1.0 full-course equivalent) from German studies in a different discipline, subject to Departmental approval, may be credited towards a degree.

4.46.9 BA in Linguistics

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Linguistics while fulfilling the following requirements:

1. *Core*: Linguistics 201, 301, 303, 319, 341, 353, 401, 403 and 407.

2. *Experiential Course*: 3 units (0.5 full-course equivalent) from: Linguistics 311, 313, 331, 441, 467, 505.

3. *Linguistics Options*: 12 units (2.0 full-course equivalents) from the Field of Linguistics (exclusive of Linguistics 321).

C. OTHER REQUIREMENTS

1. *Language*: At least 6 units (1.0 full-course equivalent) from courses in languages other than English including the following courses on programming languages: Computer Science 217, 219, 231, 313, 355, 449.

2. *Methods*: At least 3 units (0.5 full-course equivalent) from the following list of formal-methods courses: Linguistics 560, Philosophy 279, 377, Psychology 312, Sociology 311 and Statistics 213.

D. DEGREE OPTIONS

The BA in Linguistics can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

The BA in Linguistics can be taken with a concentration in Applied Linguistics or Speech-Language Sciences (see 4.46.11 or 4.46.12).

Notes:

- In special circumstances, the Undergraduate Advisor may approve the following substitute methods courses: Anthropology 411, Geography 339, Political Science 399 or Sociology 313.
- Linguistics 321 does not count towards the Linguistics Major.
- All students, especially those interested in the Honours program, are strongly encouraged to meet specific degree requirements as early in their program as possible. Students are strongly advised to take the 301/401 sequence in a single academic year, and the 303/403 sequence in a single academic year.
- Linguistics 341 should be taken either before or concurrently with 303.

4.46.10 BA Honours Linguistics

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 51 units (8.5 full-course equivalents) and a maximum of 72 units (12.0 full-course

equivalents) in the Field of Linguistics while fulfilling the following requirements:

1. *Core*: Linguistics 201, 301, 303, 319, 341, 353, 401, 403 and 407.

2. *Capstone*: Linguistics 598.

3. Experiential Course: 3 units (0.5 full-course equivalent) from: Linguistics 311, 313, 331, 441, 467, 505.

4. Linguistics Options: At least 15 units (2.5 full-course equivalents) from the field of Linguistics (exclusive of Linguistics 321).

5. Advanced Linguistics: Of the courses used to fulfill requirements 3-4 above:

(a) at least 12 units (2.0 full-course equivalents) must be at the 400 level or above, and

(b) at least 3 units (0.5 full-course equivalent) must be at the 500 level or above.

C. OTHER REQUIREMENTS

1. *Language*: At least 6 units (1.0 full-course equivalent) from courses in languages other than English including the following courses on programming languages: Computer Science 217, 219, 231, 313, 355, 449.

2. *Methods*: At least 3 units (0.5 full-course equivalent) from the following list of formal-methods courses: Linguistics 560, Philosophy 279, 377, Psychology 312, Sociology 311 and Statistics 213.

3. *Supporting Courses*: At least 3 units (0.5 full-course equivalent) from each of the following three disciplines: Anthropology, Philosophy and Psychology.

D. DEGREE OPTIONS

The BA Honours in Linguistics can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

The BA in Linguistics can be taken with a concentration in Applied Linguistics or Speech-Language Sciences (see 4.46.11 or 4.46.12).

Notes:

- In special circumstances, the Undergraduate Advisor may approve the following substitute methods courses: Anthropology 411, Geography 339, Political Science 399 or Sociology 313.
- Honours students, in particular, are strongly encouraged to meet specific degree requirements as early in their program as possible.
- Students are strongly advised to take the Linguistics 301/401 sequence in a single academic year, and the Linguistics 303/403 sequence in a single academic year.
- Linguistics 341 should be taken either before or concurrently with 303.
- The Honours thesis must be completed during the last year. Students are governed by the Honours Thesis Guidelines available from the Department of Linguistics, Languages, and Cultures.

4.46.11 Concentration in Applied Linguistics

Any student who has declared a Linguistics Major is also eligible to declare a Concentration in Applied Linguistics. Applied Linguistics is a wide-ranging field involving career paths in a variety of areas including Second Language Teaching, and Indigenous Studies.

Requirements

At least 18 units (3.0 full-course equivalents) from the following lists:

Applicable General Course: Linguistics 373 Sociolinguistics

Courses with a Language Teaching and Learning Focus:

- Linguistics 311 Second Language Acquisition I
- Linguistics 313 Classroom-Oriented Second Language Research
- Linguistics 331 First Language Acquisition
- Linguistics 381 The History of English
- Linguistics 411 Second Language Acquisition II
- Linguistics 431 Child Language: Syntax and Morphology
- Linguistics 433 Child Language: Phonology and the Lexicon

Courses with an Indigenous Studies Focus:

- Linguistics 531 Survey of Aboriginal Languages of the Americas
- Sociology 307 Sociology of First Nations in Canada

Notes:

- Those most interested in the "Language Teaching and Learning Focus" should include appropriate language and culture courses among their electives.
- Any exceptions or substitutions are at the discretion of the Undergraduate Advisor.

4.46.12 Concentration in Speech-Language Sciences

Any student who has declared a Linguistics Major is also eligible to declare a Concentration in Speech-Language Sciences. This Concentration provides an opportunity for students intending to pursue a career path in Speech-Language Pathology.

A graduate program in Speech-Language Pathology is not offered at the University of Calgary. Graduate programs are offered at the University of Alberta, University of British Columbia, Dalhousie University, McGill University, Université de Montréal, University of Ottawa, University of Toronto, and University of Western Ontario. Students considering graduate study in Speech-Language Pathology are advised to investigate the entrance requirements of these programs, as these may differ across universities. A document with general information on Canadian programs in Speech-Language Pathology and Audiology may be obtained from the Linguistics, Languages, and Culture website: llc.ucalgary.ca/linguistics-program/slp-programs-canada.

1. *Speech-Language Science Courses*: At least 15 units (2.5 full-course equivalents) from the following list, of which at least 6 units (1.0 full-course equivalent) must be in Linguistics:

- Linguistics 331, First Language Acquisition
- Linguistics 337, Introduction to Speech-Language Pathology
- Linguistics 431, Child Language: Syntax and Morphology
- Linguistics 433, Child Language: Phonology and the Lexicon
- Linguistics 441, Phonetics II
- Linguistics 467/Psychology 467, Experimental Psycholinguistics
- Psychology 200, Principles of Psychology I (200 and 201 are prerequisites for most Psychology courses)
- Psychology 201, Principles of Psychology II (200 and 201 are prerequisites for most Psychology courses)
- Psychology 351, Developmental Psychology
- Psychology 353, Psychology of Aging
- Psychology 471, Auditory Cognitive Neuroscience

2. *Quantitative Methods Course*: At least 3 units (0.5 full-course equivalent) from the following:

- Psychology 312 Experimental Design and Quantitative Methods for Psychology
- Sociology 311 and 315 Introductory Social Statistics I and II
- Statistics 213 and 217 Introduction to Statistics I and II

Notes:

- First-year courses in Biology, Calculus and Physics are also highly recommended.
- Students are advised to check the prerequisites for Psychology 400-level courses. There are enrolment limits in these courses and enrolment priority is given to Psychology Majors.

4.46.13 Minor in Linguistics

The Minor in Linguistics is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields.

Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Linguistics with at least 3.0 full-course equivalents at the 300 level or above. Linguistics 201, Linguistics 301, and Linguistics 303 must be included. The remaining courses in the program should be chosen in consultation with the Undergraduate Advisor in Linguistics.

4.46.14 Minor in Speech-Language Sciences for Linguistics Majors

Linguistics Majors become eligible to declare this Minor once they have completed Linguistics 201.

Required courses (24 units (4.0 full-course equivalents)):

Psychology 200: Principles of Psychology I

Psychology 201: Principles of Psychology II

Psychology 312 (6 units (1.0 full-course equivalent)) Experimental Design and Quantitative Methods for Psychology

Psychology 351 Developmental Psychology

Psychology 365 Cognitive Psychology or Psychology 369 Sensation and Perception

Psychology 375 Brain and Behaviour

Psychology 467 Experimental Psycholinguistics

Must take two of the following (6 units (1.0 full-course equivalent)):

Psychology 451 Cognitive Development

Psychology 471 Auditory Cognitive Neuroscience

Psychology 479 Human Neuropsychology

4.46.15 BA in Russian

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (7.0 and a maximum of 10.0 full-course equivalents) in the Field of Russian while fulfilling the following requirements:

1. *Upper-Level Courses:* 9 units (1.5 full-course equivalents) in Russian at the 400 level or above.

2. *Russian Options:* An additional 33 units (5.5 full-course equivalents) from the Field of Russian.

C. DEGREE OPTIONS

The BA in Russian can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: Upon admission to the Major in Russian each student will be assigned a departmental advisor who will assist with program planning and course selection.

4.46.16 BA Honours Russian

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Russian while fulfilling the following requirements:

1. *Honours Thesis*: Russian 591.

2. *Russian Options*: An additional 51 units (8.5 full-course equivalents) from the Field of Russian.

C. DEGREE OPTIONS

The BA Honours in Russian can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students interested in applying for Honours should discuss their plans with and seek the advice of the Undergraduate Director. Upon admission to Honours in Russian each student will be assigned a departmental advisor who will assist with program planning and course selection.
- An area of focus consisting of at least 12 units (2.0 full-course equivalents) in the area of Social Analysis or Linguistics is strongly recommended (see the Department website for details).
- In the final year the student must take Russian 591 (Honours Project). This will require the preparation of an Honours Thesis under close departmental supervision.
- Students intending to take an Honours program in Russian should note that the sequence of Russian 301, 303 and 361 is recommended by the Department as providing the best foundation for Honours level work in senior courses.
- A background in one or more related fields such as History, Philosophy, Linguistics, and English is considered an advantage for prospective Honours students.

4.46.17 Minor in Russian

The Minor in Russian is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must complete between 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) in Russian including at least 3.0 full-course equivalents at the senior level.

4.47 Medieval, Renaissance and Reformation Studies

Overview of Programs and Procedures

The Faculty of Arts offers a Minor Field of specialization in Medieval, Renaissance and Reformation Studies. Students intending to pursue this Minor are encouraged to consult with the Program Director for advice on selecting courses appropriate to the Minor and to their interest and background.

This Minor is designed to provide a multidisciplinary knowledge of the history, culture and thought of two key periods in the development of the Western European world. At the same time, it allows for specialization in areas of interest such as medieval art and literature, medieval and early modern France, the growth of European empires, or medieval and early modern performance cultures.

The Minor is intended to complement Major programs in related fields, such as History, English and Religious Studies. The Minor is desirable for students contemplating graduate-level work in related fields.

Contact Information and Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Field of Medieval, Renaissance and Reformation Studies

The Field of Medieval, Renaissance and Reformation Studies consists of the subject areas and courses listed below:

1. The Fine Arts

(Departments of Art, Drama, and Music)

Art History 201, 203, 327, 329, 357

Drama 342

Music 231, 233

2. History (Department of History)

History 319, 321, 326, 327, 336, 371, 509

3. Literature

(Departments of English; Linguistics, Languages, and Culture; and French, Italian and Spanish)

English 205, 311, 401, 403, 405, 406, 409, 410, 411, 412, 413

French 453, 455

Linguistics 435

Spanish 563, 567

4. Philosophy, Politics and Religion

(Departments of Philosophy; Classics and Religion; and Communication, Media, and Film Studies)

Communication and Culture 301, 303

Philosophy 301, 303, 403

Religious Studies 385, 387, 484

5. Languages

(Departments of English; and Classics and Religion)

A maximum of 6 units (1.0 full-course equivalent) towards the Minor can be taken from:

Courses labelled Greek

Courses labelled Latin

English 401, 403 (Old English)

4.47.1 Minor in Medieval, Renaissance and Reformation Studies

The Minor in Medieval, Renaissance and Reformation Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) with at least 18 units (3.0 full-course equivalents) at the 300 level or above. In addition, at least 6 units (1.0 full-course equivalent) must be completed in each of three of the five Subject Areas comprising the Field of Medieval and Early Modern Studies. No more than 6 units (1.0 full-course equivalent) can be counted from Area 5, Languages.

Notes:

- Some of the courses listed above have prerequisites or require permission of the department. It is the student's responsibility to ensure that prerequisites are completed and/or approvals have been received.
- The Program Director may approve additional, courses when they have significant Medieval or Early Modern emphasis.

4.48 Multidisciplinary Studies

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Multidisciplinary Degrees

Bachelor of Arts (BA) in Communication and Culture

Bachelor of Science (BSc) in Communication and Culture

Bachelor of Communication and Culture (BCC)

Concurrent BA in Communication and Culture/Bachelor of Education

Introduction

The Faculty of Arts offers three- and four-year multidisciplinary degree programs that provide an opportunity for students to design their own programs with a particular focus. These degrees are multidisciplinary in the sense that they do not have a Major Field. A Minor Field is required to provide a sense of cohort and intellectual focus. For more information, prospective students should visit the Faculty of Arts Website and consult with an Arts Degree Advisor in the Arts and Science Undergraduate Programs Office.

Contact Information and Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission

Prospective students wishing to enter a Multidisciplinary Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Multidisciplinary Degrees With Distinction

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of any student achieving a grade point average of 3.60 over the final 90 units (15.0 full-course equivalents) of a 120 unit (20.0 full-course equivalent) BA (multidisciplinary) degree, or the final 60 units (10.0 full-course equivalents) of a 90 unit (15.0 full-course equivalent) BCC (multidisciplinary) degree. A student who has taken part of their work at another university or who has transferred into the Faculty may be granted a degree "With Distinction" at the discretion of the Faculty.

4.48.1 BA in Communication and Culture

The Bachelor of Arts in Communication and Culture is a four-year multidisciplinary degree.

Note: The BA in Communication and Culture is not available with Honours and it may not be used in a Combined Degree Program or subsequently completed as a Second Baccalaureate Degree with any of the following programs:

- Bachelor of Communication and Culture degree or equivalent
- BA or BSc (Major) program
- BA or BSc in Communication and Culture
- Bachelor of Communication and Media Studies
- Bachelor of Film Studies

A. Faculty of Arts Requirements

1. Overall Program: Successful completion of an approved program consisting of 120 units (20.0 full-course equivalents).

2. Multidisciplinary Study: Successful completion of the multidisciplinary requirements listed below.

3. Academic Achievement:

(a) A minimum GPA of 2.00 must be achieved over all courses.

(b) A maximum of 18 units (3.0 full-course equivalent) "D" or "D+" grades overall.

4. University of Calgary Study: A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

5. Depth: A maximum of 48 units (8.0 full-course equivalents) at the junior or 200 level.

6. Breadth: A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science.

7. Physical Activity Courses: A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

B. Multidisciplinary Requirements

1. Minor Field: Successful completion of an approved Minor Field. **Note:** It may be difficult to complete Minors that require limited enrolment courses. Not more than 36 units (6.0 full-course equivalents) may be from any one Department or from any group of courses that would comprise a Major Field.

2. Multidisciplinary Breadth: Either Communication and Culture 301 and 303 or a second approved minor.

3. Literature: 3 units (0.5 full-course equivalent) in English literature or other literature, including Comparative Literature.

4. Writing: 3 units (0.5 full-course equivalent) chosen from Communication and Media Studies 363, 369 or Science 311.

Note: It is recommended a second minor be chosen from within the Faculty of Arts.

4.48.2 BSc in Communication and Culture

Note: Applications to this program are currently suspended while the program is under review. Students currently in the BSc in Communication and Culture should continue to follow the program as described below.

The Bachelor of Science in Communication and Culture is a four-year multidisciplinary degree focusing on courses in the Domain of Science, which includes all courses offered by the Faculty of Science and many additional science-based courses from disciplines within the Faculty of Arts. For more information, see the list of “Courses in the Domain of Science” in Section 4.14.11.

Students interested in a multidisciplinary program with a focus on science should also consider the BSc (Natural Sciences) Program offered by the Faculty of Science.

Note: The BSc in Communication and Culture is not available with Honours and it may not be used in a Combined Degree Program or subsequently completed as a Second Baccalaureate Degree with any of the following programs:

- Bachelor of Communication and Culture degree or equivalent
- BA or BSc (Major) program
- BA or BSc in Communication and Culture
- Bachelor of Communication and Media Studies
- Bachelor of Film Studies

A. Faculty of Arts Requirements

1. Overall Program: Successful completion of an approved program consisting of 120 units (20.0 full-course equivalents).

2. Program Focus: Successful completion of the multidisciplinary requirements listed below.

3. Academic Achievement:

(a) A minimum GPA of 2.00 must be achieved over all courses.

(b) A maximum of 18 units (3.0 full-course equivalent) "D" or "D+" grades overall.

4. University of Calgary Study: A maximum of 60 units (10.0 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

5. Depth: A maximum of 48 units (8.0 full-course equivalents) at the junior or 200 level.

6. Breadth: A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science.

7. Physical Activity Courses: A maximum of 6 units (1.0 full-course equivalent) may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

B. Multidisciplinary Requirements

1. Minor Field: Successful completion of an approved Minor Field. **Note:** It may be difficult to complete Minors that require limited enrolment courses. Not more than 36 units (6.0 full-course equivalents) may be from any one Department or from any group of courses that would comprise a Major Field.

2. Interdisciplinary Course: General Studies 300.

3. Literature: 3 units (0.5 full-course equivalent) in English literature or other literature, including Comparative Literature.

4. Writing: 3 units (0.5 full-course equivalent) chosen from Communication and Media Studies 363, 369 or Science 311.

5. Intercultural Requirement to be fulfilled in one of the following two ways:

(a) Successful completion of at least 6 units (1.0 full-course equivalent) from an approved post-secondary Term Abroad, Group Travel Study or Individual Travel Study program. See the Centre for International Students and Study Abroad for programs that are currently offered.

OR

(b) Successful completion of 12 units (2.0 full-course equivalents) from the Domain of Intercultural Courses.

6. Science Requirement: At least 63 units (10.5 full-course equivalents) must be from the Courses in the Domain of Science (See section 4.14.11).

4.48.3 Bachelor of Communication and Culture

The three-year (90 units (15.0 full-course equivalents)) Bachelor of Communication and Culture degree program provides a foundation of knowledge in the liberal arts that can be completed in a reduced period of time. Some students take this degree for its own sake and others as a foundation for further credentials. If students are intending to use this degree as a step to a career in teaching, they should take into consideration Alberta Teacher Certification Requirements. For further details, refer to the Werklund School of Education website.

Notes:

- The Bachelor of Communication and Culture is not available with Honours and it may not be used in a Combined Degree Program or subsequently completed as a Second Baccalaureate Degree.
- A three-year degree is not accepted as a preparation for graduate-level study.

A. FACULTY OF ARTS REQUIREMENTS

1. Overall Program: Successful completion of an approved program consisting of 90 units (15.0 full-course equivalents.

2. Multidisciplinary: Successful completion of the multidisciplinary requirements listed below.

3. Academic Achievement:

(a) A minimum GPA of 2.00 must be achieved over all courses.

(b) A maximum of 12 units (2.0 full-course equivalent) "D" or "D+" grades overall.

4. University of Calgary Study: A maximum of 45 units (7.5 full-course equivalents) in eligible post-secondary transfer credits from other institutions may be counted toward the degree.

5. Depth: A maximum of 42 units (7.0 full-course equivalents) at the junior or 200 level.

6. Breadth: A minimum of 6 units (1.0 full-course equivalent) from the Faculty of Science.

7. Physical Activity Courses: A maximum of 6 units (1.0 full-course equivalent may be taken from: Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory and Physical Education Activity/Theory.

B. MULTIDISCIPLINARY REQUIREMENTS

1. Minor Field: Successful completion of an approved Minor Field from within or outside the Faculty of Arts.

Note: It may be difficult to complete minors that require limited enrolment courses. Not more than 36 units (6.0 full-course equivalents) may be from any one Department or from any group of courses that would comprise a Major Field.

2. Multidisciplinary Breadth: Either Communication and Culture 301 and 303 or a second approved minor.

3. Literature: 3 units (0.5 full-course equivalent) in English literature or other literature, including Comparative Literature.

4. Writing: 3 units (0.5 full-course equivalent) chosen from Communication and Media Studies 363, 369 or Science 311.

Note: It is recommended a second minor be chosen from within the Faculty of Arts.

4.49 Museum and Heritage Studies

See Art.

4.50 Music

See School of Creative and Performing Arts.

4.51 Philosophy

Overview of Programs and Procedures in Philosophy

Baccalaureate Degrees Offered

Degrees in Philosophy

Bachelor of Arts (BA) in Philosophy

BA in Philosophy with Co-operative Education

BA Honours in Philosophy

BA Honours in Philosophy with Co-operative Education

Degrees in Women's Studies

Bachelor of Arts (BA) in Women's Studies

BA in Women's Studies with Co-operative Education

BA Honours in Women's Studies

BA Honours in Women's Studies with Co-operative Education

Related Interdisciplinary Degrees (See separate listings)

BA in Religious Studies and Applied Ethics*

BA and BA Honours in the History and Philosophy of Science*

**Applications to this program are currently suspended. No new admissions will be permitted.*

Notes:

- Minors are offered in Philosophy and Women's Studies.
- A related interdisciplinary Minor is offered in the History and Philosophy of Science.
- A concentration is available in Philosophy and Religion.

Introduction

Those choosing Philosophy as their Major Field of concentration should be aware that an appropriate competence in the Field requires a suitable selection of courses within the major areas of Philosophy. In particular, the Department feels strongly that a student well trained in the Field should have a familiarity with contemporary analytical procedures, with the foundations of formal logic and with at least some of the major classical figures of Western Philosophy.

It is recommended that students considering Philosophy as a possible Major Field begin with Philosophy 201 or 249. Upper-year transfer students could choose one of Philosophy 301, 303 and 305.

Students majoring in Philosophy should seek advice from the Department before each registration. Since many philosophical problems have their origins in other non-philosophical disciplines, students should not only consult about which philosophy courses to take but also about which non-philosophy courses might most benefit them. Advice may be obtained from members of the Department's Undergraduate Committee.

The Women's Studies Major program is designed to provide students with knowledge of the rapidly developing disciplinary and interdisciplinary literature in the field, while providing them with an understanding of the reasons for the development of a feminist scholarship. From its activist and academic perspective, the program will help prepare students for careers in government, social work, and business, while also providing them with a mode of analysis applicable to related fields, and to their own lives.

First year students in Women's Studies are encouraged to explore courses in a variety of areas. It is recommended that a first year program include: Women's Studies 201 and at least an additional 12 units (2.0 full-course equivalents) from the Faculty of Arts. Degree programs in Women's Studies include senior-level courses offered by various Departments either as core requirements or as options. It is therefore useful to take first year courses from a variety of related areas such as Sociology and History.

Students seeking advice on first year course selection may contact the Program Co-ordinator or the Arts Students' Centre.

Contact Information

Department Office: Social Sciences 1256

Phone: 403.220.5531/5533

Fax: 403.289.5698

Email: phildept@ucalgary.ca

Website: phil.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the Department of Philosophy (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Philosophy or Women's Studies) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Admission to Honours

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework.

Philosophy: In addition to completing an application in the online Student Centre by the February 1 deadline, students must submit a completed application form for Philosophy 590 (Honours Thesis) to the Department of Philosophy office. The application form must be signed by a thesis supervisor and include preliminary thesis proposal. To meet the February 1 deadline, it is recommended that students wishing to enrol in the Honours program obtain guidelines and an application form from the Department no later than January 1. Students are strongly advised to secure a thesis supervisor no later January 15.

Women's Studies: Students majoring in Women's Studies are eligible to apply for Honours by the February 1 deadline only if they will complete the program during the following academic year.

In addition to completing an application in the online Student Centre by the February 1 deadline, students must submit a completed application form for Interdisciplinary Studies 590 (Honours Thesis) to the Program Co-ordinator. The application form must be signed by a thesis supervisor and include preliminary thesis proposal. To meet the February 1 deadline, it is recommended that students wishing to enrol in the Honours program obtain guidelines and an application form from the Program Co-ordinator no later than January 1. Students are strongly advised to secure a thesis supervisor by January 15.

Overlapping Programs

Programs in Philosophy cannot be taken in conjunction with the minor in History and Philosophy of Science.

Field of Philosophy

The Field of Philosophy consists of all courses labelled Philosophy (PHIL) and Religious Studies (RELS) 363, 444, 445, and 463.

Field of Women's Studies

The Field of Women's Studies consists of the following courses:

- All courses labelled Women's Studies (WMST)
- Anthropology 331, 427
- Archaeology 503
- Canadian Studies 361
- Development Studies 375
- English 317, 387 (when topic is Literature and Women), 389 (when topic is Women)
- Film 307
- Greek and Roman Studies 315
- History 308, 438, 442, 501, 551
- Law and Society 335
- Philosophy 337
- Political Science 417, 453, 551, 554
- Religious Studies 381, 479
- Sociology 303, 371, 403
- Urban Studies 311

Note: Most of the courses listed above have prerequisites that lie outside the Field of Women's Studies. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

4.51.1 BA in Philosophy

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (8.0 and a maximum of 10.0 full-course equivalents) in the Field of Philosophy while fulfilling the following requirements:

1. *Logic:* One of Philosophy 279 or 377.
2. *Core Courses*: Philosophy 395 and 397.
3. *Upper-Level Courses:* 30 units (5.0 full-course equivalents) from the Field of Philosophy at the 400 level or above.
4. *Philosophy Options:* an additional 9 units (1.5 full-course equivalents) from the Field of Philosophy.

C. OTHER REQUIREMENTS

Language Requirement: 6 units (1.0 full-course equivalent) in a language other than English.

D. DEGREE OPTIONS

The BA in Philosophy can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students are advised to take one of Philosophy 201, 249, or 259 in their first year, in addition to the required Philosophy 279.
- Students must choose their courses carefully at the 200 and 300 level to ensure that they have the prerequisites for entry to the 400- and 500-level courses.

4.51.2 BA Honours Philosophy

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Philosophy while fulfilling the following requirements:

1. *Logic:* Philosophy 279 or 377; and Philosophy 379.
2. *Core Courses*: Philosophy 395 and 397.
3. *Honours Seminar*: Philosophy 597.
4. *Honours Thesis*: Philosophy 590.
5. *Upper-Level Courses:* An additional 30 units (5.0 full-course equivalents) from the Field of Philosophy at the 400 level or above.
6. *Philosophy Options:* an additional 9 units (1.5 full-course equivalents) from the Field of Philosophy.

C. OTHER REQUIREMENTS

Language Requirement: 6 units (1.0 full-course equivalent) in a language other than English.

D. DEGREE OPTIONS

The BA Honours in Philosophy can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students are advised to take one of Philosophy 201, 249, or 259 in their first year, in addition to the required Philosophy 279.
- Students must choose their courses carefully at the 200 and 300 level to ensure that they have the prerequisites for entry to the 400- and 500-level courses.

4.51.3 Minor in Philosophy

The Minor in Philosophy is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Philosophy with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

The study of Philosophy can deepen and enrich understanding of a variety of other disciplines. The courses to be included in a Minor will vary from student to student, so it is important that students seek advice from the Department. The Department of Philosophy website provides a list of Philosophy courses that support other Majors, which

students might choose to include in a Minor in Philosophy.

4.51.4 BA in Women's Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) in Women's Studies while fulfilling the following requirements:

1. Core Courses: 12 units (2.0 full-course equivalents) Women's Studies 201, 311, 315 and 405.

2. Women's Studies Options: an additional 36 units (6.0 full-course equivalents) chosen from the Field of Women's Studies. Students may apply to have a course not on the list to be counted toward their degree, at the discretion of the program co-ordinator.

C. DEGREE OPTIONS

The BA in Women's Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students entering the program in their third or fourth year of study may apply to the Program Co-ordinator to have an additional Women's Studies Option counted in lieu of Women's Studies 201.
- Students may apply to the Program Co-ordinator to have Communication and Culture 507 (Collaborative Learning and Peer Mentoring) counted as a Women's Studies option if they are mentoring in a Women's Studies course.
- Students are encouraged to take at least 6 units (1.0 full-course equivalent) at the 400 level or higher in their areas of interest (in addition to Women's Studies 405).
- It is recommended that where possible, students should take courses labelled Women's Studies (WMST) to fulfill degree requirements.

4.51.5 BA Honours Women's Studies

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) in the Women's Studies while fulfilling the following requirements:

1. Core Courses: 12 units (2.0 full-course equivalents) Women's Studies 201, 311, 315 and 405.

2. Women's Studies Options: an additional 36 units (6.0 full-course equivalents) chosen from the Field of Women's Studies. Students may apply to have a course not on the list to be counted toward their degree, at the discretion of the program co-ordinator.

3. Undergraduate Thesis: Women's Studies 590.

C. DEGREE OPTIONS

The BA Honours in Women's Studies can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students entering the program in their third or fourth year of study may apply to the Program Co-ordinator to have an additional Women's Studies Option counted in lieu of Women's Studies 201.
- Students may apply to the Program Co-ordinator to have Communication and Culture 507 (Collaborative Learning and Peer Mentoring) counted as a Women's Studies option if they are mentoring in a Women's Studies course.
- Students are encouraged to take at least 6 units (1.0 full-course equivalent) at the 400 level or higher in their areas of interest (in addition to Women's Studies 405 and 590).
- It is recommended that where possible, students should take courses labelled Women's Studies (WMST) to fulfill degree requirements.

4.51.6 Minor in Women's Studies

The Minor in Women's Studies is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Women's Studies with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The Women's Studies Minor also requires:

1. Core Courses: 9 units (1.5 full-course equivalents) chosen from Women's Studies 201, 311, 315 and 405.

2. Breadth in Women's Studies: 21 units (3.5 full-course equivalents) chosen from the Field of Women's Studies.

Notes:

- Students are encouraged to enrol in Women's Studies 405.
- It is recommended that where possible, students should take courses labelled Women's Studies (WMST) to fulfill the requirements of the minor.

4.52 Political Science

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Political Science

BA in Political Science with Co-operative Education

BA Honours in Political Science

BA Honours in Political Science with Co-operative Education

Concurrent BA in Political Science and Bachelor of Education

Bachelor of Arts (BA) in International Relations

BA in International Relations with Co-operative Education

Concurrent BA in International Relations and Bachelor of Education

Note: A Minor is offered in Political Science.

Introduction

The Department of Political Science offers courses in the principal fields of the discipline: Canadian government, political theory, comparative politics, and international relations. The BA (Political Science) program is designed to expose students to each of these fields, as well as to encourage an appreciation of the broader themes and issues that cut across them (see "Courses of Instruction" for Table of Principal Field courses).

In addition, Political Science 439 introduces the area of strategic studies, which is more prominent at the graduate level, and provides students an opportunity to contribute to advanced research in this area while completing their bachelor's degrees (see the Departmental brochure for further details).

The Department of Political Science also offers an Interdisciplinary Major in International Relations. The BA (International Relations) is designed to expose students to the diversity of approaches to the study of international relations while also providing an opportunity for individualized programs that reflect student interests. The program is structured around a common core set of courses, a regional cluster focused on a specific area of the world, and a thematic specialization focused on major approaches to the study of international relations.

The BA (International Relations) requires careful selection of courses to meet its requirements. Students should consult with the Program Co-ordinator concerning their course selection. There is neither a Minor nor an Honours program available in International Relations.

Advice and information about Political Science courses and programs may be obtained from the Political Science Advisor and the Undergraduate Director or International Relations Program Co-ordinator. Detailed course descriptions for individual courses or for different sections of a single course are available in the departmental office.

Contact Information

Department Office: Social Sciences 756

Phone: 403.220.5950

Fax: 403.282.4773

Email: poli@ucalgary.ca

Website: poli.ucalgary.ca/

International Relations Program Co-ordinator: intrprog@ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Program Director located in the

Department of Political Science (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Political Science) Program and the BA (International Relations) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Limitation of Enrolment

Due to high demand, admission to the BA (International Relations) is limited. Whenever demand exceeds capacity, enrolment will be limited and students will be admitted on a competitive basis. Admission averages are typically set above the minimum level for the Faculty of Arts. These higher admission standards are applicable to high-school applicants, external transfer applicants from other post-secondary institutions and internal transfer applicants from other programs at the University of Calgary, whether inside or outside the Faculty of Arts.

Admission to Honours

The Faculty of Arts procedures for Admission to BA Political Science (Honours) established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework. Students wishing to be considered for admission into BA Political Science (Honours) program must have completed at least 30 units (5.0 full-course equivalents). The application deadline is February 1.

Field of Political Science

The Field of Political Science consists of all courses labelled Political Science (POLI). For categorization of subfields, see table at beginning of course offerings.

Field of International Relations

Courses in the Field of International Relations are grouped into Core Courses, Thematic Clusters and Regional Clusters:

A. Core Courses: Anthropology 203, Economics 201, 203, Geography 205 or 213, History 307, Political Science 381, International Relations 301 and 501.

B. Thematic Clusters

The thematic clusters reflect major approaches to and foci within International Relations:

1. *International Political Economy*

This cluster focuses on the economic relations of states and other actors in the world economy, and the ramifications of these relations, including their political aspects.

Strongly Recommended Courses: Economics 321, 423 and Political Science 485.

Additional Courses: Anthropology 303, 379, 393, 485; Development Studies 375, 393, 403, 405, 485; Economics 327, 337, 371, 425, 427, 527, 537; Geography 341, 425; History 494; Philosophy 329; Political Science 279, 463, 579; Sociology 487, 493.

2. *Security and Strategy*

This cluster focuses on the traditional core concerns of International Relations, including the use and threat of force, and the interaction of states.

Strongly Recommended Course: History 491.01.

Additional Courses: Anthropology 343, 467; Geography 365; History 303, 333, 349, 381, 383, 483, 485, 488, 489, 490, 491.02, 527, 543, 545; Political Science 435, 439, 479.

3. *International Institutions and Governance*

This cluster focuses on efforts by states to manage their co-existence through legal, institutional and other devices, both formally and informally.

Strongly Recommended Courses: Political Science 483 and 487.

Additional Courses: Anthropology 471, Economics 537; Geography 463; History 491.01, 491.02; Linguistics 309; Political Science 485, 561, 571, 581, 587; Sociology 487.

C. Regional Clusters

The regional clusters group courses to give students a deeper understanding of contemporary historical, cultural, political, economic and geographical force at work within the principal area of the world:

1. *North America*: Economics 325, 339; Canadian Studies 333; History 337, 351, 361, 463, 465, 467, 527, 535; Political Science 321, 359, 435, 477, 491, 521, 523, 577.

2. *Latin America*: Anthropology 321, 421; Archaeology 345, 355, 357; Economics 337; Geography 371; History 367, 467, 471, 472, 487, 569; Latin American Studies 211, 311, 401; Political Science 359, 473.

3. *Europe*: Central and East European Studies 313; Economics 337; Geography 397.02, 397.04; German 317; History 333, 338, 412, 413, 427; Political Science 359, 463, 464, 561; Russian 317; Romance Studies 399.

4. *Asia/Pacific*: Anthropology 323, 427; Chinese 317; East Asian Studies 331, 333, 531; Economics 337; History 317, 404; Japanese 317; Political Science 279, 359, 465; Religious Studies 303, 317, 329, 357, 359; South Asian Studies 203, 303.

5. *Middle East and North Africa*: Anthropology 319; Economics 327, 337, 427, 527; Political Science 359, 369, 469, 479, 569; Religious Studies 353, 357.

6. *Africa*: African Studies 301, 400, 501; Anthropology 317; Archaeology 399; Economics 337; Geography 377; Political Science 359, 371, 471; Religious Studies 339, 353.

Notes:

- Most of the courses listed above have prerequisites that lie outside the Field of International Relations. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.
- Development Studies 401 and 501 may be used towards either the International Institutions and Governance or International Political Economy clusters depending on the topic and subject to approval by the Program Co-ordinator.

4.52.1 BA in Political Science

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Political Science while fulfilling the following requirements:

1. *Introduction:* 6 units (1.0 full-course equivalent) in Political Science at the 200 level.

2. *Canadian Politics:* Political Science 321.

3. *Breadth in Political Science:* 33 units (5.5 full-course equivalents) from the Field of Political Science, which must include any three of the following:

(a) Political Science 310.

(b) Political Science 359 and an additional 3 units (0.5 full-course equivalent) in "Comparative Politics" at the 300 level or above (see note below).

(c) Political Science 381 and an additional 3 units (0.5 full-course equivalent) in "International Relations" at the 300 level or above (see note below).

(d) Political Science 399.

(e) *Advanced-Level Political Science:* Inclusive of the courses used to fulfill requirement 3, at least 12 units (2.0 full-course equivalents) must be at the 400 level or above.

Note:

- The categories of courses that fulfill the requirements for Comparative Politics and International Relations are located before the Political Science courses in the "Courses of Instruction" section of this calendar: ucalgary.ca/pubs/calendar/current/political-science.

C. DEGREE OPTIONS

The BA in Political Science can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.52.2 BA Honours Political Science

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Political Science while fulfilling the following requirements:

1. *Introduction:* 6 units (1.0 full-course equivalent) in Political Science at the 200 level.

2. *Canadian Politics:* Political Science 321.

3. *Breadth in Political Science:* 39 units (6.5 full-course equivalents) from the Field of Political Science, which must include all four of the following:

(a) Political Science 310.

(b) Political Science 359 and an additional 3 units (0.5 full-course equivalent) in "Comparative Politics" at the 300 level or above (see note below).

(c) Political Science 381 and an additional 3 units (0.5 full-course equivalent) in "International Relations" at the 300 level or above (see note below).

(d) Political Science 399.

(e) *Advanced-Level Political Science:* Inclusive of the courses used to fulfill requirements 3 above, at least 9 units (1.5 full-course equivalents) must be at the 400 level or above, including at least 6 units (1.0 full-course equivalent) at the 500 level.

4. *Honours Seminar and Thesis:* Political Science 590 and 591.

Notes:

- The categories of courses that fulfill the requirements for Comparative Politics and International Relations are located before the Political Science courses in the "Courses of Instruction" section of this calendar: ucalgary.ca/pubs/calendar/current/political-science.
- Honours thesis will be read by two faculty members who will provide an assessment. The final grade will then be assigned by the thesis supervisor.

C. OTHER REQUIREMENTS

Language: 6 units (1.0 full-course equivalent) in a Language other than English or the equivalent.

D. DEGREE OPTIONS

The Honours BA in Political Science can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.52.3 Minor in Political Science

The Minor in Political Science is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Political Science with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.52.4 BA in International Relations

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of International Relations while fulfilling the following requirements:

1. Core Courses: Anthropology 203, Economics 201, 203, Geography 205 or 213, History 307, Political Science 381, International Relations 301 and 501.

2. Thematic Cluster: 12 units (2.0 full-course equivalents), of which at least 6 units (1.0 full-course equivalent) must be at the 400 level or above, from a single one of the three thematic clusters: International Political Economy, Security and Strategy or International Institutions and Governance. (See the Field of International Relations for more information.)

3. Regional Cluster: 12 units (2.0 full-course equivalents), of which at least 6 units (1.0 full-course equivalent) at the 400 level or above, from a single one of the six regional clusters: North America; Latin America; Europe; Asia/Pacific; Middle East and North Africa; and Africa.

C. OTHER REQUIREMENTS

1. Language Requirement: 12 units (2.0 full-course equivalents) in a single Language other than English.

2. Statistics Requirement: Political Science 399, Statistics 205, 213, or equivalent.

D. DEGREE OPTIONS

The BA in International Relations can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Notes:

- Students should select a language of study that will assist them with their research on an understanding of the world. Culture courses offered in English by language departments cannot be used toward this requirement.
- Apart from International Relations 501, the core courses should be taken early in a student's program. International Relations 501 is open to all students after their second year, and after they have completed 301.
- Students may take International Relations 597 (Independent Study) or existing Departmental independent study courses from their declared clusters, but only 3 units (0.5 full-course equivalent) may be counted towards the Major. Any proposed syllabus for such independent study, whether International Relations 597 or existing departmental independent study courses, must be approved by the Program Director. Students may include Geography 397 (Regional Geography of Selected World Areas) and 592 (Overseas Field Studies in Social and Economic Geography) in their regional electives, with the permission of the Program Director, provided the region(s) covered are relevant to their declared group electives. Questions about requirements may be directed to the Program Director.

4.53 Primatology

See Anthropology and Archaeology.

4.54 Psychology

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Psychology

Bachelor of Science (BSc) in Psychology

BA Honours in Psychology

BSc Honours in Psychology

Combined BA or BSc in Psychology/Bachelor of Community Rehabilitation (Medicine)

Related Interdisciplinary Degrees (See separate listings):

BSc Honours in Neuroscience (Faculty of Science)

Note:

- A Minor is offered in Psychology
- A Minor in Speech-Language Sciences is available to students majoring Psychology

Introduction

Students wishing to take a Psychology degree that emphasizes the social sciences and humanities should register for the BA degree; those who wish to emphasize the biological and natural sciences should register for the BSc degree. Students who are interested in pursuing graduate study in Psychology should consider the Psychology BA or BSc Honours Program.

Contact Information

Department Office: Administration 275

Phone: 403.220.5561

Fax: 403.282.8249

Undergraduate Program Email: psycugrd@ucalgary.ca

Graduate Program Email: psycgrad@ucalgary.ca

Website: psychology.ucalgary.ca

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising.

For more specific advice regarding course selection and requirements in the major field, students should consult the Undergraduate Programs Advisor located in the Department of Psychology (consult Department website for contact information).

Admission to the Major

Prospective students must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Limitation of Enrolment

Due to high demand, admissions to the BA and BSc Degree programs in Psychology are limited. Whenever demand exceeds capacity, enrolment will be limited and students will be admitted on a competitive basis. Admission averages are typically set above the minimum level for the Faculty of Arts. These higher admission standards are applicable to high-school applicants, external transfer applicants from other post-secondary institutions and internal transfer applicants from other programs at the University of Calgary, whether inside or outside the Faculty of Arts.

For the BSc and BSc Honours programs in Psychology, students are required to complete seven first-year science courses (see Other Requirements for the BSc in Psychology and the BSc Honours). To enter these courses students must have previously

completed Mathematics 30, Mathematics 30-1 or Pure Mathematics 30, Biology 30, and Chemistry 30 or equivalent. Mathematics 31 and Physics 30 are recommended.

Admission to Honours

Psychology Majors are eligible to apply for Honours upon completion of at least 72 units (12.0 full-course equivalents).

Due to high demand, the qualifying grade point average for eligibility for admission to Honours Psychology is typically set higher than the minimum 3.30 level for the Faculty of Arts. When this is the case, the qualifying average for the following year is announced on the Department website by October 1. For the purpose of admission to Honours, a student's grade point average is calculated over the most recent course work to a maximum of 60 units (10.0 full-course equivalents) inclusive of courses from other institutions as well as the University of Calgary.

Psychology Majors must apply for admission to the Honours program no later than January 23 of the year prior to their final year. Admission is contingent on the availability of an eligible thesis supervisor, as well as the availability of the resources (laboratory space, equipment, etc.) needed to complete the thesis. Students are encouraged to consult with the Psychology Advisor well before the January 23 deadline to determine their eligibility.

Courses and Registration

Registration in 400- and 500-level Psychology courses is restricted to Psychology Majors. Refer to the "Schedule of Classes" for further details on these restrictions.

University of Calgary BA in Psychology at Red Deer College

This program allows students to transfer up to two years of Red Deer College work and to qualify for the BA in Psychology by completing the required University of Calgary courses at Red Deer College. For further information, please contact the Department of Psychology.

Students admitted to the Psychology Major in the University of Calgary program at Red Deer College may not register in Psychology courses offered on the Calgary campus without the permission of the Associate Dean, Undergraduate Programs and Student Affairs.

Overlapping Programs

Programs in Psychology cannot be taken in conjunction with programs in Neuroscience. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees.

Field of Psychology

The Field of Psychology consists of all courses labelled Psychology (PSYC).

Note: While Psychology 203 may be taken for overall degree credit, it does not count toward the minimum requirements for the Major or Honours in Psychology.

4.54.1 BA in Psychology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 45 units (7.5 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Psychology while fulfilling the following requirements:

1. *Introduction:* Psychology 200 and 201.
2. *Research Methods and Statistics:* Psychology 312.
3. *Foundation Courses:* 15 units (2.5 full-course equivalents) from Psychology 345, 351 or 353, 365 or 369, 375, and 383 or 385.
4. *Upper-Level Courses:* At least 18 units (3.0 full-course equivalents) at the 400 or 500 level.
5. *Laboratory Components:* Of the courses used to fulfill requirement 4, at least 6 units (1.0 full-course equivalent) must have a laboratory component.

4.54.2 BSc in Psychology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 45 and a maximum of 60 units (7.5 and a maximum of 10.0 full-course equivalents) in the Field of Psychology while fulfilling the following requirements:

1. *Introduction:* Psychology 200 and 201.
2. *Research Methods and Statistics:* Psychology 312.
3. *Foundation Courses:* 15 units (2.5 full-course equivalents) from Psychology 351 or 353, 365, 369, 375, and 345 or 383 or 385.
4. *Upper-Level Courses:* At least 18 units (3.0 full-course equivalents) at the 400 or 500 level.
5. *Laboratory Components:* Of the courses used to fulfill requirement 4, at least 6 units (1.0 full-course equivalent) must have a laboratory component.

C. OTHER REQUIREMENTS

Science Courses: Biology 241 and 243; Chemistry 201 or 211 and 203 or 213; Mathematics 249 or 265 and one of 211, 213, 253, 267; and Physics 211 or 221 or 227.

4.54.3 BA Honours Psychology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 and a maximum of 72 units (10.0 and a maximum of 12.0 full-course equivalents) in the Field of Psychology while fulfilling the following requirements:

1. *Introduction:* Psychology 200 and 201.
2. *Research Methods and Statistics:* Psychology 312.
3. *Foundation Courses:* 15 units (2.5 full-course equivalents from Psychology 345, 351 or 353, 365 or 369, 375, and 383 or 385.
4. *History of Psychology:* Psychology 305 or 405. Psychology 405 can also be applied to fulfill the requirements listed in 8 below.
5. *Advanced Research Methods:* one of Psychology 407, 411, or 415. The course used to satisfy this requirement cannot be used toward requirement 8.
6. *Honours Seminar:* Psychology 501, which must be completed during the final year. This course cannot be used toward requirement 8.
7. *Honours Thesis and Seminar:* Psychology 598, which must be completed during the final year. This course cannot be used toward Requirement 8.
8. *Upper-Level Courses:* At least 18 units (3.0 full-course equivalents) at the 400 or 500 level from the Field of Psychology in addition to those used to fulfill requirements 5-7.
9. *Laboratory Component:* Of the courses used to fulfill requirement 8, at least 6 units (1.0 full-course equivalent) must have a laboratory component. Students who complete more than one of Psychology 407, 411 and 415 may apply other courses from this list toward this to requirement.

4.54.4 BSc Honours Psychology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 and a maximum of 72 units (10.0 and a maximum of 12.0 full-course equivalents) in the Field of Psychology while fulfilling the following requirements:

1. *Introduction:* Psychology 200 and 201.
2. *Research Methods and Statistics:* Psychology 312.
3. *Foundation Courses:* 15 units (2.5 full-course equivalents) from Psychology 351 or 353, 365, 369, 375, and 345 or 383 or 385.
4. *History of Psychology:* Psychology 305 or 405. Psychology 405 can also be applied to fulfill the requirements listed in 8 below.
5. *Advanced Research Methods:* one of Psychology 407, 411, or 415. The course used to satisfy this requirement cannot be used toward requirement 8.
6. *Honours Seminar:* Psychology 501, which must be completed during the final year. This course cannot be used toward requirement 8.
7. *Honours Thesis and Seminar:* Psychology 598, which must be completed during the final year. This course cannot be used toward Requirement 8.
8. *Upper-Level Courses:* At least 18 units (3.0 full-course equivalents) at the 400 or 500 level from the Field of Psychology in

addition to those used to fulfill requirements 5-7.

9. *Laboratory Component:* Of the courses used to fulfill requirement 8, at least 6 units (1.0 full-course equivalent must have a laboratory component. Students who complete more than one of Psychology 407, 411 and 415 may apply other courses from this list toward this to requirement.

C. OTHER REQUIREMENTS

Science Courses: Biology 241 and 243; Chemistry 201 or 211 and 203 or 213; Mathematics 249 or 265 and one of 211, 213, 253, 267; and Physics 211 or 221 or 227.

4.54.5 Combined BA or BSc (Psychology)/BCR (Medicine)

This five-year program leads to a Bachelor of Community Rehabilitation and Disability Studies from the Cumming School of Medicine and either a Bachelor of Arts or Science in Psychology from the Faculty of Arts. A minimum of 150 units (25.0 full-course equivalents) must be successfully completed.

Students pursuing this program may enter the combined degree in first year in either the Faculty of Arts or the Cumming School of Medicine. To qualify for the combined degree program, students must satisfy the admission requirements for both Faculties, for the Department of Psychology and for Community Rehabilitation and Disability Studies.

The program requires careful selection of courses to complete all requirements of the two Faculties. Interested students should consult with the Arts Degree Advisors and the Psychology Advisor for the Faculty of Arts as well as the Student Advisor in the Community Rehabilitation and Disability Studies program. If courses have been chosen carefully, it is normally possible for students to opt out of their combined degree program until the end of their third year and still complete a single degree program in four years. If courses have been unevenly distributed, however, it may require more than four years to complete a single degree.

Program details are listed in the Cumming School of Medicine section of this Calendar under 3. Community Rehabilitation and Disability Studies.

4.54.6 Minor in Psychology

The Minor in Psychology is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields.

Students must successfully complete at least 30 and not more than 36 units (5.0 and not more than 6.0 full-course equivalents) from the Field of Psychology including Psychology 200, 201 and 312. Spaces in Psychology courses are limited and cannot be guaranteed for Minors. Registration in 400- and 500-level Psychology courses is normally restricted to Psychology Majors.

4.54.7 Minor in Speech-Language Sciences for Psychology Majors

Psychology Majors become eligible to declare this Minor once they have completed Psychology 200 and 201.

Required courses (24 units (4.0 full-course equivalents)):

Linguistics 201 Introduction to Linguistics I

Linguistics 301 English Syntax

Linguistics 303 Phonology I

Linguistics 331 First Language Acquisition

Linguistics 337 Introduction to Speech-Language Pathology

Linguistics 341 Phonetics I

Linguistics 441 Phonetics II

Linguistics 467 Experimental Psycholinguistics

Must take two of the following (6 units (1.0 full-course equivalent)):

Linguistics 311 Second Language Acquisition I

Linguistics 411 Second Language Acquisition II

Linguistics 431 Child Language: Syntax and Morphology

Linguistics 433 Child Language: Phonology and the Lexicon

4.55 Religious Studies

See Classics and Religion.

4.56 Religious Studies and Applied Ethics

Applications to this program are currently suspended. No new admissions will be permitted.

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Religious Studies and Applied Ethics

BA in Religious Studies and Applied Ethics with Co-operative Education

Introduction

The Major in Religious Studies and Applied Ethics is offered jointly by the Department of Philosophy and the Department of Classics and Religion. Students wishing to enrol in this program should consult the Philosophy Advisor or the Program Director. A Minor Field of Specialization is not offered in Religious Studies and Applied Ethics.

In the program of study that leads to the Bachelor of Arts in Religious Studies and Applied Ethics, students learn to identify moral problems that arise in contemporary society and develop skills to evaluate responses. Students learn about religious worldviews that may inform moral decisions and develop sensitivity to cultural and religious contexts of ethical decision-making.

Contact Information

Website: phil.ucalgary.ca/undergrad/barrels.

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Admission to the Major

Prospective students wishing to enter the BA (Religious Studies and Applied Ethics) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Overlapping Programs

The program in Religious Studies and Applied Ethics cannot be taken in conjunction with programs in Philosophy or Religious Studies. This restriction applies to Major-plus-Minor combinations, Double Majors, Combined Degrees and Second Baccalaureate Degrees. A maximum of 60 units (10 full-course equivalents) is allowed in any discipline within the Major Field of Religious Studies and Applied Ethics.

Field of Religious Studies and Applied Ethics

The Field of Religious Studies and Applied Ethics consists of all courses labelled Philosophy (PHIL) and Religious Studies (RELS).

4.56.1 BA in Religious Studies and Applied Ethics

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 51 units (8.5 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Religious Studies and Applied Ethics while fulfilling the following requirements:

1. *Introduction:* Religious Studies 203, 205, and 3 units (0.5 full-course equivalent) from Religious Studies 201, 273.

2. *Western and Eastern Religion:* 3 units (0.5 full-course equivalent) at the 300 level or above from the Western Religion Stream and 3 units (0.5 full-course equivalent) at the 300 level or above from the Eastern Religion Stream. (See the "Field of Religious Studies" under Religious Studies.)

3. *Nature of Religion:* Religious Studies 331 and 343.

4. *Research in Religious Studies:* Religious Studies 377 and 577.

5. *Moral Philosophy:*

(a) Philosophy 347, 449, 451;

AND

(b) 6 units (1.0 full-course equivalent) from Philosophy 313, 325, 329, 337, 345, 453;

AND

(c) 3 units (0.5 full-course equivalent) from Philosophy 547, 549.

6. *Philosophy Options:* An additional 6 units (1.0 full-course equivalent) in Philosophy.

C. OTHER REQUIREMENTS

Language Requirement: 6 units (1.0 full-course equivalent) in a language other than English.

D. DEGREE OPTIONS

The BA in Religious Studies and Applied Ethics can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

Note: With the approval of the Program Director, higher-level courses dealing with similar topics may be substituted for the required courses.

4.57 Russian

See Linguistics, Languages, and Culture.

4.58 School of Creative and Performing Arts

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Dance

Bachelor of Arts (BA) in Dance

Bachelor of Fine Arts (BFA) in Dance

Combined BA in Dance/Bachelor of Kinesiology (Kinesiology)

Note:

- A Minor is offered in Dance

Drama

Bachelor of Fine Arts (BFA) in Drama

Concurrent BFA in Drama Education/Bachelor of Education

Note:

- A Minor is offered in Drama.

Music

Bachelor of Arts (BA) in Music

BA Honours in Music

Bachelor of Music (BMus) in Performance, Composition, Music History and Theory, or Integrated Studies

Concurrent BMus in Music Education/Bachelor of Education

Note:

- Minors in Music and Sonic Arts are also offered.

Introduction

The School of Creative and Performing Arts (SCPA) is a dynamic new initiative designed to provide both rigorous and distinct disciplinary programs and uncommon opportunities for interdisciplinary exchange and collaboration. Hosting programs in Dance, Drama and Music, the SCPA provides students a range of options for specialization and innovation, both within and across its participating divisions.

Dance provides a four-year BA (Dance) degree and a four-year BFA (Dance) degree that explores dance from multiple perspectives, as well as a five-year combined BA/BKin degree that highlights the relationships between the sciences, arts and humanities. Students delve into choreography, performance, technique, improvisation, dance for the camera, dance science, global dance, history, and theory in order to understand the place of dance in the twenty-first century. From ballet to contact improvisation, hip hop to contemporary, dance at the University of Calgary helps students gain in-depth experience as well as a broad understanding of a range of cultural forms. With emphasis on both practice and analysis, our program is designed to prepare graduates for careers in professional performance, choreography, scholarship, and education, as well as further dance study in graduate programs.

Drama offers a four-year Bachelor of Fine Arts Degree comprised of a broad curriculum including: acting, directing, scenography, playwriting, performance creation, drama education, theatre history and dramatic literature and criticism. The program allows the student to tailor their degree to their interests and their desired career path. Drama also offers a five year concurrent BFA/BED degree with the Werklund School of Education. Many of our courses are available to non-Drama students and can contribute to an elective requirement.

Music offers a four-year Bachelor of Music (BMus) Degree that is designed for students wishing to enter a professional career in music, as performers, teachers, composers, sound designers, theorists, historians or musicologists. The BMus degree provides the opportunity for students to Major in Performance, Composition, Music History and Theory or Integrated Studies. In addition there is a major in Music Education that is available in the context of a five-year concurrent BMus/Bachelor of Education degree for students wishing to pursue the Secondary Route. Students wishing to pursue the Elementary Route should complete a BA Music/Bachelor of Education degree. All BMus programs have a common first year.

Music also offers four-year programs leading to Bachelor of Arts (Music) and Honours Bachelor of Arts (Music) degrees for the student who wishes to pursue a general liberal arts education with an emphasis on Music. It is an ideal degree for students who are interested in music but may wish to pursue careers in law, medicine, arts administration, media studies, elementary education, digital arts, and so on. In addition to music courses, BA (Music) students have the flexibility to take a large number of courses outside of the field of Music, allowing them to create degree plans that cater to their individual interests and needs.

Students in all Programs at the School of Creative and Performing Arts are encouraged to meet with an Advisor early in their degree to plan and create a focus for their degrees. In addition, students are encouraged to enrich their degree programs with complementary courses, workshops and collaborations with other areas of study within the SCPA.

Students seeking advice on first-year course selection may contact the Undergraduate Programs Administrator or the Arts Students' Centre.

Contact Information

School of Creative and Performing Arts Office: Craigie Hall D100

Phone: 403.220.5313

Fax: 403.282.6925

Email: scpa@ucalgary.ca

Website: scpa.ucalgary.ca

Dance

Phone: 403.220.5313

Fax: 403.282.6925

Email: dance@ucalgary.ca

Website: scpa.ucalgary.ca/dance/welcome-dance

Drama

Phone: 403.220.5313

Fax: 403.282.6925

Email: drama@ucalgary.ca

Website: scpa.ucalgary.ca/drama/welcome-drama

Music

Phone: 403.220.5313

Fax: 403.282.6925

Email: music@ucalgary.ca

Website: scpa.ucalgary.ca/music/welcome-music

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements. Advising contact information can be found online: arts.ucalgary.ca/advising

For more specific advice regarding course selection and requirements in the major field, students should consult the SCPA Undergraduate Program Administrator.

Admission

Prospective students wishing to enter any of the programs in the School of Creative and Performing Arts must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. The application deadline is March 1.

Admission to the BA, BFA and BA/BKin in Dance

Applicants to the BA Dance, BFA Dance and BA/BKin combined degree programs will be assessed on the basis of a dance audition, an Entrance Audition Form and a Statement of Interest. For information about the Entrance Audition Form and application deadlines, refer to the SCPA Auditions Website: scpa.ucalgary.ca/studentsalumni/auditions.

Applicants to the BA/BKin combined degree program must meet the admissions requirements for both the Faculty of Arts and the

Faculty of Kinesiology (see A.2 Undergraduate Admission).

Dance Audition

After submitting an Admission Application to the University of Calgary Admissions Office and an Entrance Audition Form to the Division of Dance by the deadlines, all applicants will be expected to audition.

Auditions are conducted by the Dance Committee and are held on the University of Calgary campus in March. During the audition, applicants will be required to participate in dance classes, written assignments and improvisation.

It is strongly suggested that applicants audition in person. Applicants who are unable to audition in person must submit a DVD audition by the deadline. Refer to the SCPA Audition website for further information and requirements for video auditions.

Limitation of Enrolment

Enrolment in the Dance program is limited. Therefore, all qualified applicants may not be admitted. Applicants will be admitted on the basis of the following criteria:

1. Academic standing in high school and/or previous post-secondary education (university admission requirements);
2. Written Statement of Interest;
3. Dance audition.

Admission to the BFA in Drama

Prospective students wishing to enter the BFA Programs in Drama must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar.

Limitation of Enrolment

Enrolment in Drama programs in Drama and Drama Education is limited. Therefore, not all qualified applicants may be admitted.

Applicants will be accepted on the basis of academic standing in high school and/or previous post-secondary education completed. An audition is not required for admission to the program.

Admission to the BA in Music

Prospective students wishing to enter the BA (Music) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Admission requires evidence of successful completion of Royal Conservatory Advanced Rudiments or the Division music theory diagnostic exam.

Admission to the BA Honours Music

Students wishing to be considered for admission into BA Honours (Music) Program must have completed at least 30 units (5.0 full-course equivalents) in the BA (Music) Program and must meet the criteria established by the Faculty of Arts in section 3.4.2 Honours Degrees with a Major Field. The application deadline is February 1.

Admission to BMus Degrees

Prospective students wishing to enter BMus Programs in Music must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are set in the Applications for Admission Schedule.

Admission requires evidence of successful completion of Royal Conservatory Advanced Rudiments or the Division music theory diagnostic exam.

Admission to BMus Programs is also contingent on an audition and interview where applicants are assessed not only on actual performance, but also on talent, potential, and musicality.

Audition Dates

Auditions typically occur in late February and/or early March.

More information, deadlines and audition forms are available on the SCPA Audition website (scpa.ucalgary.ca/studentsalumni/auditions).

Audition Requirements

Applicants should be prepared to perform two pieces (except for piano and voice, who should be prepared to perform three pieces), each from a different style period; singers and instrumentalists must provide their own accompanist. Applicants should be prepared to perform for approximately 10 minutes; in addition, they will be asked to sight-read a short piece of music appropriate to their instrument or voice.

Applicants audition on the instrument of their choice or in voice. Those who would like to audition on two instruments may do so. The jury will determine which instrument (or voice) will become the major when the applicant is admitted to a Music program.

Previously accepted students who have not been enrolled in a performance practicum course for a year or more may be required to re-audition in order to determine if the previous level of attainment has been maintained.

Guidelines

As an indication of the level for admission to Music, the following guidelines should be noted:

- Pianists and vocalists should be prepared to perform repertoire at the Grade X level.
- All others should be prepared to perform repertoire at the Grade VIII level. Students who have not reached the Grade VIII level, but who have a serious interest in a career in music, are encouraged to apply and to audition at the level of performance they have reached. Suggested audition repertoire guidelines are available from the SCPA Auditions website (music.ucalgary.ca/studentsalumni/auditions).

Applicants Who Live Outside a 150 Km Radius of Calgary

BMus applicants who live further than 150 km from Calgary may submit a video or audio recording. If a recording is submitted, the student may be required to perform a live audition upon arrival. The recording should consist of approximately 10 minutes of music and conform to the requirements for auditions given above. The recording should have been made not more than two months prior to submission, should be of good quality and should be solo or solo with accompaniment. Deadlines for the receipt of video or audio recordings are on the SCPA Auditions website (scpa.ucalgary.ca/studentsalumni/auditions).

Bachelor of Music (BMus) - Major Fields of Specialization

Bachelor of Music students take a common first-year program of study and then select one of the following Major Fields of specialization:

- Composition
- Integrated Studies
- Music History and Theory
- Performance

Admission to each Major is conditional on:

1. The completion of Music 211, 213, 221, 223, 225, 231 and 233 with an average of "B-" (2.70) or better in those courses.
2. Grades of "B" (3.00) or better in courses in their area: Composition; Music History and Theory; or Performance.
3. Approval of the Division Chair.

In order to continue in Performance, students must earn an average grade of “B-“ or better in courses in that area of specialization in each academic year. Student who do not achieve this average will be required to choose a different field of specialization.

Music Students: Keyboard Proficiency Tests

Music has a required minimum level of keyboard proficiency, which all Bachelor of Music students must achieve in order to graduate. Applicants who have never played a keyboard instrument, or whose proficiency does not meet the required level, will be advised to take remedial work in keyboard, either through the Music Division or privately.

Courses and Registration

In planning their programs, students should bear in mind that some senior courses are not offered every year.

Overlapping Programs

Refer to Degrees in the Fine Arts in 1. Summary of Degree Programs for valid combinations.

Fields of Study

Field of Dance

The Field of Dance consists of Kinesiology 259 and all courses labelled Dance (DNCE).

Field of Drama

The Field of Drama consists of all courses labelled Drama (DRAM), except Drama 203 and 205.

Field of Music

The Field of Music consists of all courses labelled Music (MUSI), Music Performance (MUPF) and Music Education (MUED), which are categorized as follows:

Courses Designed for Non-Music Majors*: Music 201, 203, 209, 301, 302, 303, 304, 305, 309, 401, 402, 403, and 405 plus all ensembles under Music Performance (MUPF).

**Music majors may count a maximum of 6 units (1.0 full-course equivalent) from Music 201, 301, 302, 304, 305, 401, 402, and 405 toward their non-music options and Music minors may count a maximum of 6 units (1.0 full-course equivalent) from Music 201, 301, 302, 304, 305, 401, 402, and 405 in their program. Music majors and Music minors may not count Music 209 and 309 toward their degree requirements.*

**Students in the Sonic Arts minor may count Music 309 towards their degree requirements.*

Music Theory and Musicianship: Music 211, 213, 225, 311, 313, 325, 329, 415, 417, 511, 513

Performance: Music 221, 223, 321, 323, 327, 421, 423, 427, 429, 462, 521, 523, 525, 527, 562, all courses labelled (MUPF)

Music History and Literature: Music 203, 231, 233, 303, 331, 333, 531, 533, 535

Composition: Music 341, 343, 441, 443, 445, 447

Sonic Arts: Music 351, 355, 451, 453, 551

Music Education: all courses labelled (MUED)

Field of Fine Arts

The still broader Field of the Fine Arts consists of all course labelled Art (ART), Art History (ARHI), Dance (DNCE), Drama (DRAM), Film (FILM), Fine Arts (FINA), Music (MUSI), Music Education (MUED), Music Performance (MUPF), and School of Creative and Performing Arts (SCPA).

4.58.1 BA in Dance

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS AND NORMAL SEQUENCE

The BA in Dance requires the successful completion of the following program of study, which includes 48 units (8.0 full-course equivalents) to a maximum of 72 units (12.0 full-course equivalents) in the Field of Dance:

36 units (6.0 full-course equivalents):

- Dance 207, 209, 247 and 267
- Dance 305, 307, 331, 333, 345 and 309 or 343
- Dance 427, 481

6 units (1.0 full-course equivalents) from the following Studio Options:

- Dance 235, 311, 313, 321, 323, 405, 407

6 units (1.0 full-course equivalents) from the following Theory Options:

- Kinesiology 259
- Dance 363, 341, 391, 449, 491

C. OTHER REQUIREMENTS:

6 units (1.0 full-course equivalents) from the Field of Fine Arts (non-Dance)

Note: Dance 427, 449 and 481 are not offered every year. These courses are required without exception. Students must arrange their schedules to accommodate the alternating timetable.

4.58.2 BFA in Dance

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS AND NORMAL SEQUENCE

The BFA in Dance requires the successful completion of the following program of study, which includes 90 units (15.0 full-course equivalents) to a maximum of 105 units (17.5 full-course equivalents) in the Field of Dance:

75 units (12.5 full-course equivalents) from the following required courses:

- Dance 207, 209, 235, 247 and Kinesiology 259
- Dance 305, 307, 331, 333, 345, 363, 391, 395, 397
- Dance 405, 407, 427, 431, 433, 449, 481, 491
- Dance 505, 507, 531

12 units (2.0 full-course equivalents) from the following Studio Options:

- Dance 311, 313, 411, 413, OR
- Dance 321, 323, 421, 423

3 units (0.5 full-course equivalents) from the following Dance Options:

- Dance 309, 343, 365, 375, 475, 493, 503

C. OTHER REQUIREMENTS

- 3 units (0.5 full-course equivalents) from the Field of Fine Arts (non-Dance)

Note: Dance 427, 449 and 481 are not offered every year. These courses are required without exception. Students must arrange their schedules to accommodate the alternating timetable.

4.58.3 Combined BA (Dance)/BKin (Kinesiology)

Introduction

This five-year program leads to a Bachelor of Kinesiology (Kinesiology) from the Faculty of Kinesiology and a Bachelor of Arts in Dance from the Faculty of Arts. A minimum of 150 units (25 full-course equivalents) must be successfully completed.

Admission

Students must meet the admissions requirements for both the Faculty of Arts and the Faculty of Kinesiology (see A.2 Undergraduate Admission).

A. FACULTY OF ARTS REQUIREMENTS FOR COMBINED DEGREES

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation except that students are exempt from the requirement to take 6 units (1.0 full-course equivalent) from the Faculty of Science.

B. BA DANCE REQUIREMENTS

Dance Courses: 48 units (8.0 full-course equivalents) including:

36 units (6.0 full-course equivalents) from the following required courses:

- Dance 207, 209, 247 and 267
- Dance 305, 307, 331, 333, 345 and either 309 or 343
- Dance 427, 481

6 units (1.0 full-course equivalent) from the following Studio Options:

- Dance 235, 311, 313, 321, 323, 405, 407

6 units (1.0 full-course equivalent) from the following Theory Options:

- Dance 363, 341, 391, 449, 491

C. Other Requirements

- 6 units (1.0 full-course equivalent) from the Field of Fine Arts (non-Dance)

D. BKin (KINESIOLOGY) PROGRAM REQUIREMENTS

Refer to 4.2.8 Combined BA (Dance)/BKin (Kinesiology) in the Faculty of Kinesiology section of this Calendar.

Notes:

- The program requires careful selection of courses to complete all of the requirements of the two Faculties. When choosing their courses, students are urged to work closely with advisors in the Student Programs Office of Kinesiology, the Faculty of Arts program advisors located in the Arts Students' Centre and undergraduate program administrator for Dance.
- Dance 427, 449, and 481 are not offered every year. These courses are required without exception. Students must arrange their schedule to accommodate the alternating timetable.

4.58.4 Minor in Dance

The Minor in Dance is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Dance with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.58.5 BFA in Drama

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS AND NORMAL SEQUENCE

The BFA in Drama requires the successful completion of the following program of study, which includes 60 to 74 units (10.0 to 14.0 full-course equivalents) in the Field of Drama:

1. Core Courses: 24 units (4.0 full-course equivalents) from Drama 200, 223, 225, 240 and 340.
2. Drama Option: 36 units (6.0 full-course equivalents), including:

a. 6 units (1.0 full-course equivalent) from Drama 342, 344, 440, or both 355 and 357.

2. An additional 30 units (5.0 full-course equivalents) from the field of Drama at the 300 level or above.
3. Other Requirements: 15 units (2.5 full-course equivalents), including:

3 units (0.5 full-course equivalent) in English

12 units (2.0 full-course equivalents) selected from courses in Art, Art History, Dance, Film, Fine Arts, Music, School of Creative and Performing Arts (SCPA) and/or courses at the 300 level or above in Drama.

Notes:

- Drama 225 is a 3-unit (0.5 full-course equivalent) course normally offered in the Fall Term. Drama 223 is also a 3-unit (0.5 full-course equivalent) course but it runs over the entire year and students must register in both "A" and "B" parts. Consequently, first year course loads will be 13.5 units (2.25 full-course equivalents) for one semester and 16.5 units (2.75 full-course equivalents) for the other semester. This will still maintain full-time status; however, students are advised to contact a program advisor in the Arts Students' Centre (ASC) for information concerning their registration.
- Drama offers the opportunity for selected students to complete a professional theatre internship with local professional theatre organizations while registered in Internship 591 and 593 (see 4.58.8).
- Students intending to pursue graduate studies in Drama are reminded that most Canadian universities require a reading knowledge of at least one modern language other than English.
- The Drama Division encourages students to enrich their degree programs with complementary courses, workshops and collaborations with other areas of study within the SCPA.

4.58.6 Concurrent BFA (Drama Education)/BEd

Introduction

This five-year program leads to a Bachelor of Fine Arts in Drama Education from the Faculty of Arts and a Bachelor of Education from the Werklund School of Education. A minimum of 150 units (25.0 full-course equivalents) must be successfully completed.

Present certification requirements of the Province of Alberta can be satisfied. When planning courses, students should take into consideration Alberta Teacher Certification Requirements. For details, refer to the Werklund School of Education website.

The BFA (Drama Education) program is a specialized three-year program, which exists only in combination with the two-year BEd. It is designed for students intending either to teach drama in schools or to work as drama specialists with young people or community groups following certification. It provides extensive course work in performance creation and other aspects of the theatre, which relate directly to the particular needs of theatre with and for youth and communities.

Admission

Students must meet the admissions requirements for the Faculty of Arts as well as the Werklund School of Education as specified in the Undergraduate Admissions section of this Calendar.

A. FACULTY OF ARTS REQUIREMENTS FOR CONCURRENT DEGREES

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS FOR DRAMA

Students must successfully complete the following program of study, which includes from 60 units (10.0 full-course equivalents) to 78 units (13.0 full-course equivalents) in the Field of Drama:

Drama Courses: 60 units (10.0 full-course equivalents) including:

- Drama 200, 223, 225, 240
- Drama 340, 360, 362, 460
- Drama 564
- An additional 12 units (2.0 full-course equivalents) labelled Drama at the 300 level or above

C. BEd PROGRAM REQUIREMENTS

Refer to 4.3 Five-Year BEd (Concurrent) Program in the Werklund School of Education section of the Calendar.

Notes:

- Students in this program must complete Education 201 before they can enter their first year in the Werklund School of Education.
- Drama 225 is a 3-unit (0.5 full-course equivalent) course normally offered in the Fall Term. Drama 223 is also a 3-unit (0.5 full-course equivalent) course but it runs over the entire year and students must register in both "A" and "B" parts. Consequently, first year course loads will be 13.5 units (2.25 full-course equivalents) for one semester and 16.5 units (2.75 full-course equivalents) for the other semester. This will still maintain full-time status; however, students are advised to contact a program advisor in the Arts Students' Centre (ASC) for information concerning their registration.

4.58.7 Minor in Drama

The Minor in Drama is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields.

Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Drama with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

Note: Drama 203 and 205 are not applicable towards the minor.

4.58.8 Professional Theatre Internship

Introduction

Qualified students may apply to be placed in internship positions with local professional theatre organizations at the end of their program of study. Students may be accepted as interns in areas such as Acting, Design, Stage Management, Playwriting, Dramaturgy, Theatre Administration, and Directing. Students uncertain as to their specific career goal may be accepted as General Interns. Students accepted as interns become full-time members of a professional theatre company and are expected to devote themselves full-time to this activity. Interns are paid a monthly salary by their theatre company for the duration of the eight-month internship.

Students who are selected for the internship enrol in Internship 591.01 Professional Theatre Internship I and Internship 591.02 Professional Theatre Internship II in the Fall and Winter Terms respectively.

Internship courses are not credit courses. Tuition fees for Internship 591.01 and 591.02 are assessed as "Co-op/Intern" fees in the Undergraduate Tuition and General Fees Chart. Students enrolled in the Internship courses are eligible for the benefits available to full-time students.

Admission

To be eligible for consideration, applicants must be registered in the BFA Drama program and have completed the program requirements in the major field before participating in the internship. Applications to be considered for the internship are due to Drama's internship supervisor in February. See Drama's website for more information.

4.58.9 BA in Music

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Music while fulfilling the following requirements:

1. Foundation Courses: Music 211, 213, 231, 233, 331, 333, and 6 units (1.0 full-course equivalent) at the 300 level in Composition, Sonic Arts or Theory.
2. Music Performance and Musicianship: 9 units (1.5 full-course equivalents) from Music 225, 325, and all courses labelled Music Performance.
3. Upper-Level Courses: An additional 15 units (2.5 full-course equivalents) from the Field of Music at the 400 or 500 level including:
   a. A minimum of 3 units (0.5 full-course equivalent) in Music History and Literature, and
   b. A minimum of 3 units (0.5 full-course equivalent) in Composition, Sonic Arts or Theory.

Notes:

- It is recommended that students choose Music 451 or 453 in partial fulfillment of the Upper-Level Courses requirement.
- Students are urged to plan ahead in their selection of these courses to ensure that they meet prerequisites.
- Students with an interest in pursuing a Sonic Arts Concentration should select Music 351 and 355 to meet the Foundation Course requirement of 6 units (1.0 full-course equivalent) at the 300 level in Composition, Sonic Arts or Theory.

4.58.10 BA Honours Music

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 60 units (10.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Music while fulfilling the following requirements:

1. Foundation Courses: Music 211, 213, 231, 233, 331, 333, and 6 units (1.0 full-course equivalent) at the 300 level in Composition, Sonic Arts or Theory.
2. Music Performance and Musicianship: 9 units (1.5 full-course equivalents) from Music 225, 325, and all courses labelled Music Performance.
3. Honours Project: Music 560.
4. Upper-Level Courses: An additional 21 units (3.5 full-course equivalents) from the Field of Music at the 400 or 500 level including:
   a. A minimum of 3 units (0.5 full-course equivalent) in Music History and Literature; and
   b. A minimum of 3 units (0.5 full-course equivalent) in Composition, Sonic Arts or Theory.

Notes:

- It is recommended that students choose Music 451 or 453 in partial fulfillment of the Upper-Level Course requirement.
- Honours students in Music are required to declare a program of study during or before their third year of study. A student may define a more narrow focus of study within an area such as Music History, Music Theory, Composition, Digital Media, or Music Pedagogy, or they may link thematically across such areas.
- The Honours Project (Music 560) is usually written during the final year of a student's program, under the close supervision of a member of Music. At the end of the year, the student defends the thesis before a committee that consists of three faculty members, of which normally at least two are members of Music. The Honours project in suitable form is to be submitted by the first day of the final examinations scheduled by the Registrar in the Winter Term.
- Music 531 is recommended for students who intend to do a scholarly paper for their Honours Project.
- Students are urged to plan ahead in their selection of these courses to ensure that they meet prerequisites.
- Students with an interest in pursuing a Sonic Arts Concentration should select Music 351 and 355 to meet the Foundation Course requirement of 6 units (1.0 full-course equivalent) at the 300 level in Composition, Sonic Arts or Theory.

4.58.11 BMus in Composition

This Major is for students with a particular interest in music composition.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

The BMus in Composition requires the successful completion of the following program of study, which includes 90 units (15.0 full-course equivalents) to 99 units (16.5 full-course equivalents) in the Field of Music:

1. Common Core Program for BMus Majors:
   a. 45 units (7.5 full-course equivalents) from the following: Music 211, 213, 221, 223, 225, 231, 233, 311, 313, 321, 323, 325, 331, 333 and one of Music Performance 201, 203, 205, 211, 213 or 215
   b. Pass piano proficiency exam or successfully complete Music 127
   c. Music 101, 102, 103 and 104
2. Composition Requirements: 42 units (7.0 full-course equivalents) from:
   a. Music 341 and 343
   b. Music 441, 443, 445, 447, and 451
   c. Music 513 and 560
   d. One of Music Performance 301, 303, 305, 311, 313, 315, 321, 325, or 329
   e. Music Performance 327
   f. Music 415 or 417
   g. Music 453 or 511
3. Music History and Literature: 3 units (0.5 full-course equivalent) in Music History and Literature at the 300 level or above.

Notes:

- Conducting is recommended as one of the open options.
- The Music Division encourages students to enrich their degree programs with complementary courses, workshops and collaborations with other areas of study within the SCPA.

4.58.12 BMus in Integrated Studies

The Major is designed for students looking to build strong musical skills in a comprehensive music degree. The flexibility of years three and four allows students to gain a broad musical knowledge (for example, equal parts Music History, Music Performance and Music Theory and Composition) OR to fuse two or more areas of musical study in a way that they are unable to in the other majors (for example performance and composition, music and technology, performance and early music studies). Admission to this major will depend on a statement of interest submitted to the Division Chair of Music at the end of the first year of studies.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS AND NORMAL SEQUENCE

The BMus in Integrated Studies requires the successful completion of the following program of study, which includes 78 units (13.0 full-course equivalents) to 102 units (17.0 full-course equivalents) in the Field of Music:

1. Common Core Program for BMus Majors:
   a. 45 units (7.5 full-course equivalents) from the following: Music 211, 213, 221, 223, 225, 231, 233, 311, 313, 321, 323, 325, 331, 333 and one of Music Performance 201, 203, 205, 211, 213 or 215
   b. Pass piano proficiency exam or successfully complete Music 127
   c. Music 101, 102, 103 and 104
2. Integrated Studies Requirements: 15 units (2.5 full-course equivalent)s from the following:
   a. Music 421 and 423
   b. 9 units (1.5 full-course equivalents) from the following: Music Performance 301, 303, 305, 311, 313, 315, 321, 325, 327 or 329
3. Music Options: 18 units (3.0 full-course equivalents) from the following:
   a. 3 units (0.5 full-course equivalent) in Music History and Literature
   b. 3 units (0.5 full-course equivalent) in Composition, Sonic Arts, or Theory
   c. Music 521 and 523 or 6 units (1.0 full-credit equivalent) in Music options
   d. 3 units (0.5 full-course equivalent) in Music History and Literature and 3 units (0.5 full-course equivalent) Composition, Sonic Arts, or Theory or one of Music 462 or 560 (requires Division Chair approval)
4. Inter-arts Options:
   a. 3 units (0.5 full-course equivalent) from the Field of Fine Arts excluding Music, Music Education, and Music Performance.

Note: Students wishing to take Music 462 or 560 must obtain Division Chair permission. Students who take Music 462 will not also take Music 521 and 523.

4.58.13 BMus in Music History and Theory

This Major is for students with interest in the historical, cultural and theoretical aspects of music. Also for students wishing to pursue graduate work in musicology or music theory, with the aim of teaching in a university or a career as a music critic, music librarian,

or music editor for publishing houses and recording companies.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS AND NORMAL SEQUENCE

The BMus in Music History and Theory requires the successful completion of the following program of study, which includes 81 units (13.5 full-course equivalents) to 93 units (15.5 full-course equivalents) in the Field of Music:

1. Common Core Program for BMus Majors:
   a. 45 units (7.5 full-course equivalents) from the following: Music 211, 213, 221, 223, 225, 231, 233, 311, 313, 321, 323, 325, 331, 333 and one of Music Performance 201, 203, 205, 211, 213 or 215
   b. Pass piano proficiency exam or successfully complete Music 127
   c. Music 101, 102, 103 and 104
2. Music History and Theory Requirements:
   a. 33 units (5.5 full-course equivalents) from the following:
   Music 415
   Music 531, 560
   Two of Music 417, 445, 447 or 451
   9 units (1.5 full-course equivalent) in Music History and Literature at the 300 level or above
   6 units (1.0 full-course equivalent) from the following: Music Performance 301, 303, 305, 311, 313, 315, 321, 325, 327 or 329
3. Music Options: 3 units (0.5 full-course equivalents) from the following:
   a. 3 units (0.5 full-course equivalent) in Music History and Literature at the 300 level or above, or 3 units (0.5 full-course equivalent) in Composition, Sonic Arts, or Theory at the 500 level
4. Other Requirements: 12 units (2.0 full-course equivalents) from the following:
   a. 6 units (1.0 full-course equivalent) in a cultural or political history course approved by Music
   b. 6 units (1.0 full-course equivalent) in a language other than English

Note: The Music Division encourages students to enrich their degree programs with complementary courses, workshops and collaborations with other areas of study within the SCPA.

4.58.14 BMus in Performance

This Major is for students with talent in performance who plan to become professional instrumentalists or singers. Admission as a Major in Performance will depend on an audition before a faculty jury at the end of the first or second year. In order to continue in Performance, students must earn an average grade of "B-" or better in courses in their area of specialization in each academic year. Students who do not achieve this average will be required to choose a different field of specialization.

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

The BMus in Performance requires the successful completion of the following program of study, which includes 87 units (14.5 full-course equivalents) to 102 units (17.0 full-course equivalents) in the Field of Music:

1. Common Core Program for BMus Majors:
   a. 45 units (7.5 full-course equivalents) from the following: Music 211, 213, 221, 223, 225, 231, 233, 311, 313, 321, 323, 325, 331, 333, and one of Music Performance 201, 203, 205, 211, 213 or 215
   b. Pass piano proficiency exam or successfully complete Music 127
   c. Music 101, 102, 103 and 104
2. Music Performance Requirements: 36 units (6.0 full-course equivalents) from the following:
   a. Music 427 and 462
   b. Music 527 and 562
   c. 9 units (1.5 full-course equivalents) from Music Performance 321, 323, 325, 327, 329 or 341
   d. 9 units (1.5 full-course equivalents) from Music Performance 301, 303, 305, 311, 313 or 315
3. Music Options:
   a. 3 units (0.5 full-course equivalent) in Music History and Literature at the 300 level or above
   b. 3 units (0.5 full-course equivalent) in Composition, Sonic Art or Theory at the 300 level or above
4. Language Requirement: Voice Majors are required to complete 6 units (1.0 full-course equivalent) in French, German or Italian. Other Performance Majors are strongly urged to include two half courses in French, German, or Italian in their non-Music options.

Notes:

Voice Majors are strongly encouraged to include Music 525.

Performance majors are strongly encouraged to take a Sonic Arts course as one of their 300 level or above options.

The Music Division encourages students to enrich their degree programs with complementary courses, workshops and collaborations with other areas of study within the SCPA.

4.58.15 Concurrent BMus (Music Education)/BEd

Introduction

This five-year program leads to a Bachelor of Education from the Werklund School of Education and a Bachelor of Music in Music Education from the Faculty of Arts. A minimum of 150 units (25.0 full-course equivalents) must be successfully completed.

Present certification requirements of the Province of Alberta can be satisfied. When planning courses, students should take into consideration Alberta Teacher Certification Requirements. For details, refer to the Werklund School of Education website.

The BMus (Music Education) part of the program involves three years of study and exists only in combination with the two-year BEd program. It is designed for students intending to teach music (both instrumental and choral) in the schools at the secondary level. In addition to the core areas of performance, theory, history and musicianship, the program provides course work in conducting, vocal and instrumental techniques and appropriate pedagogy for different age groups.

Admission

Students must meet the admissions requirements for both the Bachelor of Music program (see the Overview of Programs and Procedures) and the Faculty of Arts (see A.2 Undergraduate Admission), as well as the Werklund School of Education.

A. FACULTY OF ARTS REQUIREMENTS FOR CONCURRENT DEGREES

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS FOR MUSIC EDUCATION AND NORMAL SEQUENCE

Students must successfully complete the following program of study, which includes 75 units (12.5 full-course equivalents) to 84 units (14.0 full-course equivalents) in the Field of Music.

Common Program for all BMus Majors

- Music 211, 213 and 225
- Music 231 and 233
- Music 221 and 223
- One of Music Performance 201, 203, 205, 211, 213 or 215
- 3 units (0.5 full-course equivalent) in non-Music options
- 3 units (0.5 full-course equivalent) in open options
- One of Music 101, 102, 103 or 104

Senior Music Courses

- Music 311, 313, 325
- Music 331, and 333
- Music 321, 323, 421 and 423
- 6 units (1.0 full-course equivalent) of Music Performance 301, 303, 305, 311, 313 or 315
- Music Education 331, 333, 401, 403, 413 and 415
- 3 units (0.5 full-course equivalent) in non-Music options
- 6 units (1.0 full-course equivalent) in open options
- Two of Music 101, 102, 103, or 104

Notes:

- Music Education students are encouraged to include Music Education 417 as one of their option courses.
- In addition students must successfully complete Music 127 (Class Keyboard) if piano skills are not up to the required level.
- Students in this program must complete Education 201 before they can enter their first year in the Werklund School of Education.

4.58.16 Minor in Music

Admission to the Minor in Music requires evidence of successful completion of Royal Conservatory Advanced Rudiments or the Division music theory diagnostic exam.

The Minor is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Music, with at least 15 units (2.5 full-course equivalents) at the 300 level or above. The Music Minor also requires:

1. At least 3 units (0.5 full-course equivalent) is from an ensemble course: Music Performance 201, 203, 205, 211, 213, 215, 221, 223, 225, 227, 229, 241, 301, 303, 305, 311, 313, 315, 321, 323, 325, 327, 329, 341.

2. Music minors may count a maximum of 6 units (1.0 full-course equivalent) from Music 201, 301, 302, 304, 305, 401, 402, and 405 in their program.

Note: Enrolment in Music 221 and 223 is by audition and subject to available resources. Students wishing to include these courses in their program of study should see "Audition Dates" under Overview of Programs and Procedures or contact the Music Undergraduate Program Administrator for more information on when and how to apply for an audition.

4.58.17 Minor in Sonic Arts

The following courses must be successfully completed:

- Music 351
- Music 355
- Music 451
- Music 453
- Music 551
- Music 309
- Art 251

One of:

- Music 533 (approved topic)
- Music 511 (approved topic)
- Fine Arts 503
- Fine Arts 507

Two of:

- Music 511 or Music 533 (approved topics)
- Music Performance 327
- Art 313
- Art 315

4.58.18 Concentration in Sonic Arts

The Concentration in Sonic Arts is for BMus and BA (Music) students who have an interest in electroacoustic music, soundscape composition, computer music, multi-channel sound spatialization, interactive music involving instruments with computer, and sound design for video, film, media arts and stage production.

Students can acquire a Concentration in Sonic Arts by successfully completing the following courses:

- Music 351
- Music 355
- Music 451
- Music 453
- Music 551

One of:

- Music 533 (approved topic)
- Music 511 (approved topic)
- Fine Arts 503: Topics in Fine Arts
- Fine Arts 507

Of the six courses listed above, at least five are studio-based. As such, students who complete the concentration will be well-prepared for advanced work or the job market, particularly in the arts, multimedia and creative industries, including sound recording, sound design for games, installations, media production, podcasts, etc. While encompassing different approaches and techniques to working with sound and audio (soundscape studies, concert and field recording, electroacoustic music, interactive computer applications networked music performance, etc.), the concentration forms a cohesive suite of courses to give a well-rounded presentation to the students.

Anyone interested in pursuing the Concentration in Sonic Arts should consult with an Arts Advisor early in their planning process since not all courses are offered every year.

4.59 Science, Technology and Society

See Communication and Culture.

4.60 Social and Cultural Anthropology

See Anthropology and Archaeology.

4.61 Sociology

Overview of Programs and Procedures

Baccalaureate Degrees Offered

Bachelor of Arts (BA) in Sociology

BA in Sociology with Co-operative Education

BA Honours in Sociology

BA Honours in Sociology with Co-operative Education

Concurrent BA in Sociology and Bachelor of Education

Bachelor of Arts (BA) in Law and Society

BA in Law and Society with Co-operative Education

BA Honours in Law and Society

BA Honours in Law and Society with Co-operative Education

Notes:

- A Minor is offered in Sociology and in Law and Society.
- Concentrations are available to Sociology Majors in: Criminology, Deviance and Social Control and Gender, Family and Work.

Introduction

Advice and information about Sociology courses and programs may be obtained from the Sociology Advisor and the Undergraduate Director.

The program in Law and Society is designed to provide a broad exposure to the nature of law and its role in society. The overall aim of the program is not only to provide students with as deep an understanding of the law as possible but also to demonstrate that the law is not an isolated discipline but, rather, is part of an integrated culture of which we all partake. The program is not specifically a "pre-law" program. Nevertheless, the perspectives that it offers are likely to be of great benefit to those who hope to be lawyers, as well as to those considering a career in politics, the civil service, law enforcement, the social sciences, business and industry, or public-interest advocacy.

First year students in Law and Society are encouraged to explore courses in a variety of areas. It is recommended that a first year program include: Law and Society 201, 203 and at least an additional 9 units (1.5 full-course equivalents) from the Faculty of Arts. Degree programs in Law and Society include senior-level courses offered by various Departments either as core requirements or as options. It is therefore useful to take first year courses from a variety of related areas such as Political Science and History. In planning their first year programs, students should look ahead to later years and make sure they take courses that are prerequisites to the courses they may subsequently wish to take.

Courses that are required for the Law and Society major can generally be double-counted toward minors in these programs, although students are advised to consult with the Arts Students' Centre for confirmation. The following minor programs are particularly good fits with a Law and Society major program: Political Science, History, Economics, Philosophy, Sociology, Indigenous Studies, Canadian Studies, Science, Technology and Society, Women's Studies.

Students seeking advice on first year course selection may contact the Arts Students' Centre.

Contact Information

Department Office: Social Sciences 956

Phone: 403.220.6501

Fax: 403.282.9298

Email: soci@ucalgary.ca or lwsoprog@ucalgary.ca

Website: soci.ucalgary.ca/

For Program Advice

Students should consult a program advisor in the Arts Students' Centre for information and advice on their overall program requirements.

For more specific advice regarding course selection and requirements in the major field, students should consult the subject advisor located in their home Department (consult Department website for contact information).

Sociology Students Association

The Sociology Students Association (SSA) is actively engaged in promoting the academic, social and political interests of students who Major or Minor in Sociology. The SSA fosters a sense of community within the Department and represents the interests of undergraduate Sociology students at appropriate councils and committees. All Sociology students are encouraged to become members.

Admission to the Major

Prospective students wishing to enter the BA (Sociology) Program or the BA (Law and Society) Program must meet the criteria listed in section A.2 Undergraduate Admission of this Calendar. Annual application deadlines are found in A.3 Deadline Dates for Undergraduate Applications for Admission and Transcripts.

Limitation of Enrolment

Due to high demand, admission to the Law and Society Major is limited. Whenever demand exceeds capacity, enrolment will be limited and students will be admitted on a competitive basis. Admission averages are typically set above the minimum level for the Faculty of Arts. These higher admission standards are applicable to high-school applicants, external transfer applicants from other post-secondary institutions and internal transfer applicants from other programs at the University of Calgary, whether inside or outside the Faculty of Arts.

Admission to Honours

The Faculty of Arts procedures for Admission to Honours established in section 3.4.2 Honours Degrees with a Major Field are applicable and provide the overall framework.

Students wishing to be considered for admission into the BA Sociology (Honours) program must have successfully completed Sociology 313 and at least 30 units (5.0 full-course equivalents) of course work. All beginning students who contemplate working towards a Sociology Honours degree should consult with the Department as soon as possible. This does not involve the student or the Department in any firm commitment until official admission to an Honours program is completed. Please contact the Department for the deadline.

Students majoring in Law and Society are eligible to apply for Honours by the deadline only if they will complete the program during the following academic year. To meet the deadline, it is recommended that students wishing to enrol in the Honours program consult with her or his intended supervisor in January and obtain guidelines and an application form from the Law and Society Program Co-ordinator as early as possible.

University of Calgary BA in Sociology at Red Deer College

This program allows students to transfer up to two years of College work and to qualify for the BA in Sociology by completing the required University of Calgary courses at Red Deer College. For further information, please contact the Department of Sociology.

Field of Sociology

The Field of Sociology consists of all courses labelled Sociology (SOCI).

Field of Law and Society

The Field of Law and Society consists of the following courses:

Courses with a Focus on Law and Society

All courses labelled Law and Society (LWSO)**

Anthropology 213

Business and Environment 395, 595

Canadian Studies 333, 361

Economics 345, 349, 355, 373, 377, 379

History 337, 345, 351, 438, 443, 450, 462, 473

Indigenous Studies 201, 311, 343

Law 595

Philosophy 313, 325, 329, 337, 345, 347, 361, 425*, 451, 453, 525

Political Science 283, 321, 343*, 425, 426, 444, 470 483, 541, 581

Science, Technology and Society 343, 423, 505

Sociology 307, 325, 327, 375, 421, 423, 425, 427, 429*

Women's Studies 311

Context Courses

Canadian Studies 201, 355, 439

Communication and Culture 301, 303, 501, 503

Communication and Media Studies 369

Development Studies 375

East Asian Studies 319

English 384, 385, 389

Indigenous Studies 415

Museum and Heritage Studies 331

Religious Studies 343, 349

Science, Technology and Society 325, 327, 341, 421

Sociology 400

South Asian Studies 203

Statistics 205

Research Methods Courses

Communication and Media Studies 313

Geography 340

History 300

Political Science 399

Psychology 312

Sociology 313

**Students may only apply Philosophy 425, Political Science 343 and Sociology 429 towards one requirement listed within the Law and Society Major Field Requirements below.*

***Students intending to take Law and Society 501 must consult with the Law and Society Program Co-ordinator.*

Note: Most of the courses listed above have prerequisites that lie outside the Field of Law and Society. It is the student's responsibility to ensure that prerequisites are completed. We encourage students to speak with a program advisor on a regular basis to assist with a degree planning.

4.61.1 BA in Sociology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD REQUIREMENTS

Students must successfully complete a minimum of 42 units (7.0 full-course equivalents) and a maximum of 60 units (10.0 full-course equivalents) in the Field of Sociology while fulfilling the following requirements:

1. *Core:* 18 units (3.0 full-course equivalents) from Sociology 201, 311, 313, 315, 331, and 333.

2. *Sociology Options:* A minimum of 12 units (2.0 full-course equivalents) from the Field of Sociology.

3. *Advanced-Level Sociology:* 12 units (2.0 full-course equivalents) must be at the 400 level or above.

Note: Sociology 501 conference courses can be used toward the "Advanced-Level Sociology" requirement.

C. DEGREE OPTIONS

The BA in Sociology can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements. The BA in Sociology can be taken with a concentration in (a) Criminology, Deviance and Social Control; (b) Gender, Family and Work (see Section 4.61.3).

4.61.2 BA Honours Sociology

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR-FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 48 units (8.0 full-course equivalents) and a maximum of 72 units (12.0 full-course equivalents) in the Field of Sociology while fulfilling the following requirements:

1. *Core:* 18 units (3.0 full-course equivalents) from Sociology 201, 311, 313, 315, 331, and 333.

2. *Honours Thesis:* Sociology 400.

3. *Sociology Options:* A minimum of 6 units (1.0 full-course equivalent) from the Field of Sociology.

4. *Advanced-Level Sociology: 18* units (3.0 full-course equivalents) must be at the 400 level or above.

C. DEGREE OPTIONS

The BA Honours in Sociology can be taken with Co-operative Education. See section

3.4.4 Co-operative Education Programs for information and requirements.

The BA Honours in Sociology can be taken with a concentration in (a) Criminology, Deviance and Social Control; (b) Gender, Family and Work (see Section 4.61.3).

Notes:

- Sociology Honours cannot have more than 9 units (1.5 full-course equivalents) Sociology at the 200 level.
- Under special circumstances, permission may be given to students to take courses at the 600 level.
- Completion of the Honours program will entail the submission of an acceptable Honours Thesis for Sociology 400. Prior to seeking ethics approval for research on human subjects, Honours students will be required to submit a written proposal acceptable to the supervisor.

4.61.3 Concentrations

Criminology, Deviance and Social Control

Required: Sociology 325, 327.

Four of: Sociology 421*, 423, 425, 427, 429.

**A topics course which may be taken a maximum of four times for credit toward the fulfillment of the requirements for the concentration in Criminology, Deviance and Social Control.*

Gender, Family and Work

Required: Sociology 303, 371, 393.

Three of: Sociology 365, 373, 399, 403*, 461, 471*, 493*.

**A topics course which may be taken a maximum of twice for credit toward the fulfillment of the requirements for the concentration in Gender, Family and Work.*

4.61.4 Minor in Sociology

The Minor in Sociology is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Sociology with at least 18 units (3.0 full-course equivalents) at the 300 level or above.

4.61.5 BA in Law and Society

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR FIELD WITH REQUIREMENTS

Students must successfully complete a minimum of 49 units (8.0 full-course equivalents) in the Field of Law and Society while fulfilling the following requirements:

1. *Core Courses*: 24 units (4.0 full-course equivalents) including:

(a) Law and Society 201, 203, 335, 337, 413, 415, 591;

(b) One of Political Science 343 or Philosophy 425 or Sociology 429.

2. *Courses with a focus on Law and Society*: 15 units (2.5 full-course equivalents), selected from the list of Courses with a Focus on Law and Society within the Field of Law and Society.

3. *Context Courses*: 6 units (1.0 full-course equivalent) selected from the list of Context Courses within the Field of Law and Society.

4. *Research Methods Requirement*: 3 units (0.5 full-course equivalent) from Communication and Media Studies 313, Geography 340, History 300, Sociology 313, Political Science 399 or Psychology 312.

Note: Most of the courses listed above have prerequisites, many of which are not requirements for Law and Society. It is the student's responsibility to ensure that prerequisites are completed.

C. DEGREE OPTIONS

The BA Honours in Law and Society can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.61.6 BA Honours Law and Society

A. FACULTY OF ARTS REQUIREMENTS

Students must adhere to the applicable Faculty of Arts requirements in 3.4 Graduation.

B. MAJOR FIELD WITH HONOURS REQUIREMENTS

Students must successfully complete a minimum of 54 units (9.0 full-course equivalents) in the Field of Law and Society while fulfilling the following requirements:

1. *Core Courses*: 24 units (4.0 full-course equivalents) including:

(a) Law and Society 201, 203, 335, 337, 413, 415, 591;

(b) One of Political Science 343 or Philosophy 425 or Sociology 429.

2. *Courses with a focus on Law and Society*: 15 units (2.5 full-course equivalents), selected from the list of Courses with a Focus on Law and Society within the Field of Law and Society.

3. *Context Courses*: 6 units (1.0 full-course equivalent) selected from the list of Context Courses within the Field of Law and Society.

4. *Research Methods Requirement*: 3 units (0.5 full-course equivalent) from Communication and Media Studies 313, Geography 340, History 300, Sociology 313, Political Science 399 or Psychology 312.

5. Sociology 400.

Notes:

- Most of the courses listed above have prerequisites, many of which are not requirements for Law and Society. It is the student's responsibility to ensure that prerequisites are completed.
- It is strongly recommended that students intending to pursue Honours complete Communication and Culture 301 and 303.
- A thesis must be completed, to the satisfaction of the student's honours supervisor.
- Students are strongly encouraged to take courses pertaining to other languages and cultures and to seek out opportunities to study abroad.

C. DEGREE OPTIONS

The BA Honours in Law and Society can be taken with Co-operative Education. See section 3.4.4 Co-operative Education Programs for information and requirements.

4.61.7 Minor in Law and Society

The Minor in Law and Society is regulated by the section of the Faculty of Arts Graduation Requirements entitled 3.4.3 Minor Fields. Students must successfully complete at least 30 units (5.0 full-course equivalents) and not more than 36 units (6.0 full-course equivalents) from the Field of Law and Society with at least 18 units (3.0 full-course equivalents) at the 300 level or above. The Law and Society Minor also requires:

1. Law and Society 201 and 9 units (1.5 full-course equivalents) from Law and Society 203, 335, 337, 401 and 425.

2. An additional 18 units (3.0 full-course equivalents) from List of Courses with a Focus on Law and Society, with no more than 6 units (1.0 full-course equivalent) from courses in a single subject area.

4.62 South Asian Studies

See Classics and Religion.

4.63 Spanish

See French, Italian and Spanish.

4.64 Urban Studies

See Geography.

4.65 Visual Studies

See Art.

4.66 Women's Studies

See Philosophy.

5. Administration

Arts Students' Centre

Location: Social Sciences Building, Room 102

Phone: 403.220.3580

Email address: ascarts@ucalgary.ca

Faculty of Arts Co-operative Education Office

Location: Social Sciences Building Room 110

Phone: 403.210.8509 or 403.220.8636

Fax: 403.282.8606

Email: artscoop@ucalgary.ca

Website: arts.ucalgary.ca/co-op/

Faculty of Arts Dean's Office

Location: Social Sciences Building, 13th Floor

Phone: 403.220.6151

Fax: 403.282.8606

Email: arts@ucalgary.ca

Website: arts.ucalgary.ca

Faculty Leadership

Dean

R. Sigurdson

Vice Dean

F. Strzelczyk

Associate Deans

D. Johnston, Teaching & Learning/ Student Engagement

B. Moorman, Research & Infrastructure

R. Oxoby, Research & Graduate Programs

V. Tumasz, Undergraduate Programs & Student Affairs

Cumming School of Medicine

1. Summary of Degree Programs

Degrees Offered

Undergraduate		
Community Rehabilitation	**Health Sciences**	**Professional**
BCR		
	BHSc Honours	
BA or BSc/BCR[1]		
		MD

[1]*Combined Degree with the Faculty of Arts (Psychology)*

Graduate
Graduate Science Education
MBT
MCM
MDCS
MPath
MSc
PhD

Undergraduate

The Cumming School of Medicine offers a four-year Bachelor of Health Sciences Honours (BHSc Honours) degree.

The Cumming School of Medicine offers a four-year Bachelor of Community Rehabilitation (BCR) degree as well as a two-year BCR degree after an approved college diploma or university degree.

Doctor of Medicine

The Cumming School of Medicine offers a three-year professional degree leading to a Doctor of Medicine (MD).

Postgraduate (Residency)

The Cumming School of Medicine offers various postgraduate (residency) programs that are only available to those with professional MD training. Full details can be found on the Cumming School of Medicine Postgraduate Medical Education website at ucalgary.ca/pgme.

Graduate

Graduate work leading to the Master of Biomedical Technology, Master of Community Medicine, Master of Disability and Community Studies, Master of Pathologists' Assistant, Master of Science and Doctor of Philosophy degrees is offered by the Cumming School of Medicine under the administration of the Faculty of Graduate Studies. Details of these programs appear in the Faculty of Graduate Studies calendar.

2. Faculty Information

Contact Information

Community Rehabilitation and Disability Studies

Location: Teaching, Research & Wellness (TRW) 3rd Floor

Student Information: 403.220.2985

Fax Number: 403.220.6494

Website: crds.org

Edmonton Campus:

Grant MacEwan College Mill Woods Campus, Edmonton

780.497.5175

Greater Vancouver Campus:

Douglas College, 700 Royal Avenue, New Westminster, B.C.

Bachelor of Health Sciences

Location: Health Sciences Centre G503

Student Information: 403.210.9730 or 403.210.9750

Email address: bhsc@ucalgary.ca

Website: ucalgary.ca/bhsc/

Doctor of Medicine

Location: Health Sciences Centre G740

Student Information: 403.220.4262

Email address: ucmedapp@ucalgary.ca

Website: cumming.ucalgary.ca/

3. Community Rehabilitation and Disability Studies

Introduction

Community Rehabilitation and Disability Studies offers a full range of interdisciplinary professional educational opportunities:

- A Bachelor degree in Community Rehabilitation (BCR). The BCR degree is offered both on campus and through an off-campus program, in collaboration with other post-secondary institutions and by distance delivery, based on a cohort model called Community of Learners.
- A professional diploma after a first degree.
- An undergraduate five-course minor in Community Rehabilitation and Disability Studies.
- A combined degree BA/BSc (Psychology)/BCR
- A Minor in Adapted and Therapeutic Physical Activity for Kinesiology students
- Graduate Master's and Doctoral degree programs through the Department of Community Health Sciences, Cumming School of Medicine.

Table of Contents

3.1 Undergraduate Professional Programs

Bachelor of Community Rehabilitation (BCR)

A four-year Bachelor of Community Rehabilitation (BCR) program is offered for students coming directly from high school and a two-year program is offered for those with a first degree, approved college diploma, or two full years of university prerequisite courses. The BCR is an interdisciplinary degree both in the courses it provides and the students it serves.

Students are expected to achieve a foundation in health, social science, law and management, and will work with individuals of diverse ages and disabling conditions. Through specialized interdisciplinary study, practical experience and project work, they gain professional skills in individual counselling and personal planning, team co-ordination, design and management of community

services, advocacy and small business development.

Students can specialize in areas such as career development, working with seniors, brain injury, community mental health or early intervention. Students specialize by choosing appropriate health and senior social science course options and doing their projects and practica in their chosen area.

Potential Candidates

This degree was designed for the following categories of students:

- People working in human services with a diploma or degree who need specialized and focused training in community rehabilitation practice to advance or respond to changing conditions.
- People trained in other fields who are considering a career change to work in community-based and customized services.
- People with disabilities who are interested in working in advocacy and independent living careers.
- University undergraduates interested in pursuing a four-year interdisciplinary degree in community rehabilitation.
- High school graduates interested in exploring a range of professions related to disability.

Distance Education Program

This decentralized inter-institutional model is managed by the University of Calgary in co-operation with participating colleges in Alberta and other provinces. The partner colleges provide classroom and meeting space and educational resources such as access to libraries and technological support and university transfer courses.

The cohort, called a Community of Learners, is a group of students with more than three years' experience in the field, often from diverse backgrounds who plan and evaluate course content, sequence and delivery to ensure that courses reflect local needs.

The degree is also offered by a distance delivery model.

International

The Bachelor of Community Rehabilitation degree has been made available to cohorts of students living in other countries. Suitable funding arrangements to cover the cost of delivery are established in advance of starting such programs.

For information on our programs and specific contacts, please refer to our web address: crds.org/.

Minors in Community Rehabilitation and Disability Studies

A Minor in Community Rehabilitation and Disability Studies is open to on-campus students in other faculties. A specialized Minor in Adapted and Therapeutic Physical Activity is offered for Kinesiology students by Community Rehabilitation and Disability Studies in conjunction with the Faculty of Kinesiology.

Professional Diplomas in Community Rehabilitation and Disability Studies

Community Rehabilitation and Disability Studies sponsors a post-degree program leading to a Diploma of the Cumming School of Medicine with a specialization in Community Rehabilitation and Disability Studies for those who are working in the field of community rehabilitation and disability studies or wishing to transfer their current professional training to community practice. The diploma program provides the foundation interdisciplinary skills identified by the field as necessary for practice. The diploma will also assist students in meeting the entrance requirements of the Pan Canadian Master's Degree program in Community Rehabilitation and Disability Studies.

3.2 Opportunities

Certification

Students may be eligible for the following accreditation and/or certification:

- Registered Rehabilitation Professionals (RRP) through the Vocational Rehabilitation Association of Canada (VRAC)
- Certified Vocational Evaluator through Canadian Assessment of Vocational Evaluation and Work Adjustment (CAVEWA)

Careers in Community Rehabilitation and Disability Studies

Graduates are generally employed in agencies and companies which promote community-based, customized supports and services. Graduates often begin in direct service, but their skills in transition planning, service design and supervision, may enable them to move into positions of service coordination or management and to develop their own small businesses.

Fields of practice include:

- Inclusive community supports and services
- Services for children with disabilities
- Inclusive education
- Vocational Rehabilitation and Counselling
- Community health supports
- Human services business ventures
- Medical rehabilitation and clinical practice

3.3 Student Affairs

Student Advisement

Faculty members are designated as prime contact persons with specific responsibilities for each of the degree programs. Adjunct faculty at other universities and colleges and in leading community service organizations are available as expert resources on a wide range of community rehabilitation related topics.

3.4 Resources

CRDS and Desire2Learn

All CRDS distance education Internet courses are now being offered through Desire2Learn, a tool that facilitates the creation of sophisticated Internet-based educational environments.

Community Partnerships

Many agencies and associations provide guidance and practicum support. Formal partnership agreements with other post-secondary institutions enable Community Rehabilitation and Disability Studies Students to establish distance cohorts. For more information, go to crds.org and look under "Student Tools".

3.5 Admissions (BCR)

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for regulations regarding University admission requirements. Students wishing to be admitted to the four-year Bachelor of Community Rehabilitation degree program must present high school matriculation or equivalent which must include English Language Arts 30-1 and Biology 30.

Transfer applicants to the two-year program must present a cumulative grade point average of 2.50 or higher calculated over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) (University of Calgary courses and/or transferable courses taken at other institutions). All grades within a term will be included except where the number of courses taken within a term exceeds that required to fulfill (to a maximum of) 30 units (5.0 full-course equivalents), in which case the highest grades will be used.

For entrance to the two-year Bachelor of Community Rehabilitation (BCR) degree program the applicant must:

1. Present satisfactory matriculation standing in English Language Arts 30-1 as well as all of the requirements listed in one of category (a), (b) or (c):

(a) After an Approved Community College Rehabilitation or Related Diploma. Holders of approved rehabilitation diplomas will be considered for direct admission to the post-diploma Bachelor of Community Rehabilitation Program. Post-rehabilitation diploma applicants must present 3 units (0.5 full-course equivalent) in human sciences. The human sciences course may be completed prior to or subsequent to admission and will not be included in the 60 units (10.0 full-course equivalents) required in the post-diploma program.

Holders of related community college diplomas with three years of experience in human services may be considered for admission to the post-diploma BCR route. Previous education and experience will be considered only after evaluation and recommendation by a community college offering an approved program. Applicants must present 3 units (0.5 full-course equivalent) in human sciences. The human sciences course may be completed prior to or subsequent to admission and will not be included in the 60 units (10.0 full-course equivalents) required in the post-diploma program. Depending

on the diploma, additional requisite courses may be required.

(b) After an Approved Degree. Applicants must present course work related to human services, disability and individual intervention or equivalent experience in human services. Approved degree holders who cannot present course work or equivalent experience as described above, must complete Community Rehabilitation 205, 207, 209, 321, 485, 487, and 3 units (0.5 full-course equivalent) human sciences as requisites. Requisites may be completed prior to or subsequent to admission and will be in addition to the 60 units (10.0 full-course equivalents) required in the program.

(c) Non-Degree/Non-Diploma Holders. Applicants will be required to present 60 units (10.0 full-course equivalents) which must include Community Rehabilitation 205, 207, 209, 321, 485, 487, or their equivalents, and 3 units (0.5 full-course equivalent) in human sciences. The remaining 39 units (6.5 full-course equivalents) open options must include 12 units (2.0 full-course equivalents) at the senior level. Prerequisite courses may be completed at the University of Calgary or other recognized post-secondary institutions.

2. Present a cumulative grade point average of 2.50 or higher calculated over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) (University of Calgary courses and/or transferable courses taken at other institutions) or an overall GPA of 2.50 on college diplomas. All grades within a term will be included except where the number of courses taken within a term exceeds that required to fulfill (to a maximum of) 30 units (5.0 full-course equivalents), in which case the highest grades will be used.

3. Support the application by completing a BCR Statement.

Application Deadlines

Refer to the Prospective Students link at: ucalgary.ca/prospectivestudents/.

Deadlines for BCR programs:

On-Campus:

June 30 for transcripts for applicants to two-year program

August 1 for transcripts for applicants to four-year program

Off-Campus Community of Learners and Regional Campus programs:

September 1 for applications in addition to the above dates

September 30 for transcripts in addition to the above dates

Diplomas:

June 30 for transcripts

On-campus students are admitted to the Fall Term; off-campus students are admitted either to the Fall or Winter Term.

Limitation of Enrolment

Enrolment in the four-year Bachelor of Community Rehabilitation is limited. Contact the CRDS Program for further information.

Enrolment in the two-year BCR program is also limited. Applicants will be accepted primarily on the basis of academic standing, but prior relevant experience will also apply where students have comparable grade point averages.

Open Studies

Students without prior degrees wishing to take Community Rehabilitation and Disability Studies courses as Open Studies students must get program approval as is normally prescribed within university regulations. Students with prior degrees seeking to take Community Rehabilitation and Disability Studies courses, and wishing to apply for the BCR degree program, must take all the prerequisite courses for admission to the program.

Second Baccalaureate Degree

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to programs leading to a Second Baccalaureate Degree with a Major Field or a Second Baccalaureate Degree program with Honours in a Major Field.

Students must apply to the Admissions Office and meet all deadlines and requirements. For more information regarding admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions.

3.6 Registration (BCR)

Continuity of Program

Students whose registration has been inactive for two years must reapply for admission and will be required to meet current BCR program requirements if readmitted.

The required 120 units (20.0 full-course equivalents) in the four-year degree and the 60 units (10.0 full-course equivalents) in the two-year degree must have been completed within ten years of the date of enrolment in the BCR program in order for the degree to be awarded.

Permission to Complete Courses at an Outside Institution

In the four-year program, up to 60 units (10.0 full-course equivalents) and in the two-year program, up to 30 units (5.0 full-course equivalents) may be completed at other universities in Canada or elsewhere. Written permission must be obtained from the Student Advisor, Community Rehabilitation and Disability Studies prior to registering at another university.

3.7 Student Standing (BCR)

Academic Standing

Performance Review, Probationary Status and Dismissal

The academic standing of each student registered in the Cumming School of Medicine will be reviewed annually following the Winter Term as per the GPA requirements table.

GPA Requirements:

2.50 or above: Satisfactory standing

1.70 - 2.49: Continuation in BCR on probation

0.00 – 1.69: Required to withdraw from the faculty

University regulations permit students a maximum of one probationary period while registered as an undergraduate student. Students who are on academic probation will have to maintain a GPA of at least 2.50 in each subsequent year in order to continue in the BCR program. Students who are Required to Withdraw may be able to enter another program.

Any students wishing to appeal an academic ruling please see section I.4 for details.

A grade point average based on all courses taken to date at the University of Calgary is calculated as described under F. Academic Standing in the Academic Regulations section of this Calendar except that lower grades in repeated courses are not included.

Students are required to maintain a grade point average of at least 2.50 in Community Rehabilitation and Disability Studies courses in order to be admitted to the practicum courses (Community Rehabilitation 594, 595, 597) and to be granted the BCR degree. Please note that a minimum GPA of 3.00 in the practicum courses is required for the BCR degree to be granted.

Minimal Pass

If a student receives a "D" or "D+" grading (minimal pass) in a course, they will not be allowed to use this course as a prerequisite to a higher level course except with the consent of the Head of the Department offering the course. Students may repeat a course once in order to raise their standing.

Repeating Courses

Students may repeat a course previously attempted (including withdrawals) only once without permission of the Faculty office. Practicum courses offered by Community Rehabilitation and Disability Studies, may not be repeated after a failing grade has been received without:

(a) The prior consent of the Director, Rehabilitation and Disability Studies;

(b) Presenting evidence of having made an attempt to overcome previous difficulties encountered;

(c) Waiting a reasonable period of time (one semester to one calendar year) prior to repetition.

Excessive Number of Withdrawals

Students will not be permitted to withdraw more than once from a particular course. Students will be required to withdraw if they have accumulated a total of more than 30 units (5.0 full-course equivalents) withdrawals while in attendance at the University of Calgary.

Unsatisfactory Standing

Students are referred to the section on F. Academic Standing in the Academic Regulations section of this Calendar. Standing is unsatisfactory when:

(a) The record indicates that a student has "F" grades in 12 units (2.0 full-course equivalents) in any one year, or

(b) The student has an accumulated total of "F" grades in the equivalent of 18 units (3.0 full-course equivalents), or

(c) The grade point average falls below 2.50 calculated as described in F. Academic Standing.

When a record is unsatisfactory for any one of the three reasons listed, the student will be required to withdraw.

Dean's List

The Dean's List recognizes the outstanding academic achievement of students. To be included, a student must achieve a grade point average of at least 3.60 over all University of Calgary courses taken in the preceding Fall and Winter Terms, with a minimum of 30 units (5.0 full-course equivalents) to be counted. A statement of inclusion on the Dean's List will be recorded on the student's transcript. Students on academic sanction are not eligible for the Dean's List.

3.8 Graduation (BCR)

Graduation Requirements

1. Successful completion of the approved program with a minimum overall grade point average of 2.00. In addition, students must achieve an overall grade point average of 2.50 or better in the Community Rehabilitation courses taken, with a minimum grade point average of 3.00 in practicum courses.

2. In the two-year program, the 60 units (10.0 full-course equivalents) required for graduation must all have been completed within 10 years of first enrolment for the degree to be awarded. In the four-year program, the 120 units (20.0 full-course equivalents) required for graduation must all have been completed within 10 years of first enrolment for the degree to be awarded.

Degrees "With Distinction"

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of all BCR students whose grade point averages in Community Rehabilitation courses places them in the top 10 per cent of the graduands.

3.9 BCR Requirements

There are three routes within the Bachelor of Community Rehabilitation Program:

1. Four-year interdisciplinary degree route (BCR)

2. Two-year post-diploma or degree route (Community of Learners Degree Program – off and on-campus)

3. Two-year post-diploma or degree route (Regional Integrated Employment Learning Model Program)

Five-year Combined Degree:

4. Combined BA or BSc (Psychology)/BCR

Two minors are available to students in other faculties:

5. Minor in Community Rehabilitation and Disability Studies

6. Minor in Adapted and Therapeutic Physical Activity (for Kinesiology students only)

Post-degree Diploma:

7. Professional Diploma in Community Rehabilitation and Disability Studies

3.9.1 Four-Year BCR Degree

Students may apply for admission in either year one or year three. During years one and two, students establish foundation skills in Community Rehabilitation and Disability Studies and are encouraged to begin a program of studies in another discipline (for example, Arts, Social Work). In years three and four students complete required Community Rehabilitation and Disability Studies courses and are encouraged to complete a program of studies in another discipline.

Years 1 and 2

1. Community Rehabilitation 205

2. Community Rehabilitation 207

3. Community Rehabilitation 209

4. Community Rehabilitation 485

5. Community Rehabilitation 487

6. Biology 205

7. Community Rehabilitation 321 or equivalent

8. Psychology 200

9. Psychology 201

10. - 17. A program of studies in disciplines other than Community Rehabilitation and Disability Studies

18. - 20. Open Options

Years 3 and 4

Core Courses

21. One of Community Rehabilitation 415, 569 or 573

22. Community Rehabilitation 425

23. Community Rehabilitation 551

24. Community Rehabilitation 594

25. Community Rehabilitation 595

26. Community Rehabilitation 581

27. Community Rehabilitation 583

28. One of Community Rehabilitation 471, 473 or 475

Required Multidisciplinary Courses

29., 30. Community Rehabilitation Options

31. - 34. Health related courses including human anatomy and physiology

35. - 38. Senior Social Sciences, Education or Social Work related to community practice, social policy or clinical specialities

39. - 40. Management options

3.9.2 Community of Learners Degree Program (Part-time study based on previous work experience)

The Community of Learners (COL) approach was initiated to enable rehabilitation practitioners who are already employed to attain a two-year BCR degree. A COL is a group of fifteen or more experienced professionals who commit themselves to plan together and support each other in completing the degree with the University of Calgary and other local or linked post-secondary institutions. Candidates have a prior diploma or degree plus a minimum of three years of relevant experience. Courses are offered by various means, including the Internet and condensed delivery.

Core Courses

1. Community Rehabilitation 551

2. Community Rehabilitation 425

3. One of Community Rehabilitation 471, 473, or 475

4. Community Rehabilitation 596

5. Community Rehabilitation 594 or 595

6. Community Rehabilitation 573 or 569

7. Community Rehabilitation 581

8. Community Rehabilitation 583

Required Multidisciplinary Courses

9., 10. Community Rehabilitation Senior Option, plus Academic Writing 303

11. - 14. Health related courses including human anatomy and physiology

15. - 18. Senior Social Sciences, Education or Social Work related to community practice, social policy or clinical specialties

19., 20. Management courses

3.9.3 Regional Integrated Employment Learning Model Program (Integrated work experience/course work)

Two regional campus programs, in Vancouver and Edmonton, offer this integrated model for full-time pre-service students, along with part-time working students. Courses delivered in face to face and online format.

Core Courses

1., 2. Academic Writing 303 and foundation options such as Community Rehabilitation 555

3. Community Rehabilitation 425

4. One of Community Rehabilitation 471, 473, 475

5. Community Rehabilitation 569 or 573

6., 7. Two of Community Rehabilitation 594, 595, 596

8. Community Rehabilitation 551

9. Community Rehabilitation 581

10. Community Rehabilitation 583

Required Multidisciplinary Courses

11., 12., 13., 14. Health related courses including human anatomy and physiology

15., 16. Management related courses

17., 18., 19., 20. Senior Social Science Option courses

3.9.4 On-Campus, Community of Learners and Integrated Employment Learning Model

1. Details relating to sequence, registration, prerequisites and methods of delivery for Community of Learners degree programs reflect local needs and resources. Refer to the specific contacts online at: crds.org/.

2. Community of Learners courses are open to local or distance students who have Internet access and meet academic requirements for admission to courses. Please contact the local COL co-ordinator for more details.

3. A detailed listing of inter-faculty and inter-institutional option courses is available online at crds.org/ or from the Community Rehabilitation program. Students intending to pursue graduate programs are recommended to take a senior research/statistics course.

4. Students who will be in practica or seeking employment should be aware of the following regulation:

Provincial legislation requires that new employees and volunteers in publicly funded agencies, residential services, and day programs are subject to a criminal record check. This means that a criminal record check will be required prior to employment in health care and social service programs in Alberta. Please contact the Human Resources Department of the agency at which you will be employed if you require further information.

Most agencies where students complete practica require a criminal record check and/or child welfare clearance of students. Students should be prepared to provide such documentation prior to the commencement of the course.

3.10 Combined BA or BSc (Psychology)/BCR

This five-year program leads to both the Bachelor of Arts in Psychology (offered by the Faculty of Arts) and the Bachelor of Community Rehabilitation (offered by the Cumming School of Medicine) degrees, and is jointly sponsored by the two faculties. Completion of the program requires a minimum of 150 units (25.0 full-course equivalents).

Admission

Students pursuing this program may enter the combined degree in year one in either the Faculty of Arts or the Cumming School of Medicine. Admission requirements of both Faculties, the Department of Psychology and Community Rehabilitation Studies, must be satisfied in order to qualify for the combined degree program.

The program requires careful selection of courses to complete all requirements of the two Faculties. Interested students are urged to contact the Associate Dean (Student Affairs) of Arts and the Student Advisor in the Community Rehabilitation and Disability Studies Program. It will be possible for students to opt out of the combined program until the end of their third year and complete either a BA or BSc in Psychology or a BCR degree in four years. Students should note, however, that if courses have been unevenly distributed, more than four years may be required to complete the degree.

Requirements

1. The Faculty of Arts requires the successful completion of both: (a) the "Faculty of Arts Requirements for Combined Degree" or “Faculty of Arts Requirements for Combined Degrees with an Honours Component” listed in the Faculty of Arts, section 3.4.6 Combined Degrees, and (b) the requirements for the BA or BSc Psychology listed in section 4.54 Psychology. Students should seek Psychology course registration advice from a program advisor in the Arts Students' Centre.

2. Students in the BA or BA Honours Psychology/BCR program must complete Biology 205 and 305.

3. The Cumming School of Medicine requires successful completion of all courses required for graduation with a BCR degree as listed in section 3.9 Graduation (BCR).

4. The following required Community Rehabilitation courses must be completed, normally in the specified sequence. At least 42 units (7.0 full-course equivalents) from this list must be taken at the University of Calgary.

Year 1

Community Rehabilitation 205

Community Rehabilitation 207

Community Rehabilitation 209

Biology 205

3 units (0.5 full-course equivalent) option

Year 2

Community Rehabilitation 321

Community Rehabilitation 485

Community Rehabilitation 487

6 units (1.0 full-course equivalent) option

Year 3

Community Rehabilitation 551

Community Rehabilitation 553

One of: Community Rehabilitation 471, 473, 475

Biology 305

3 units (0.5 full-course equivalent) option

Year 4

Community Rehabilitation 425

Any Community Rehabilitation option

Community Rehabilitation 583

One of senior practicum: Community Rehabilitation 594, 595

3 units (0.5 full-course equivalent) Community Rehabilitation option

3 units (0.5 full-course equivalent) option

Year 5

Community Rehabilitation 569

Community Rehabilitation 581

One of senior practicum: Community Rehabilitation 594, 595

18 units (3.0 full-course equivalents) option

3.11 Minor in Community Rehabilitation and Disability Studies

A Minor in Community Rehabilitation and Disability Studies is available to students registered in other Faculties (e.g. Arts, Kinesiology, Science). All students are required to take:

- Introductory Courses: 9 units (1.5 full-course equivalents) from Community Rehabilitation 205, 207, 209, 425.
- Practica: 6 units (1.0 full-course equivalent) from Community Rehabilitation 485, 487, 594, 595.
- 15 units (2.5 full-course equivalents) from Community Rehabilitation 415, 425, 471, 473, 475, 535, 551, 553, 555, 569, 573, 581, 583, 594, 595.

Please contact the program or the CRDS student planner for information: crds.org/.

3.12 Minor in Adapted and Therapeutic Physical Activity

This Minor is offered by Community Rehabilitation and Disability Studies for students in Kinesiology.

Requirements

1. Six units (1.0 full-course equivalent) from the following introductory courses: Community Rehabilitation 205, 207, 209.

2. Six units (1.0 full-course equivalent) course practica from: Community Rehabilitation 485, 487, 594, 595.

3. Nine units (1.5 full-course equivalents) required courses: Community Rehabilitation 425, 475 and Kinesiology 369.

4. Nine units (1.5 full-course equivalents) Community Rehabilitation courses: two from Community Rehabilitation 545, 547, 551, 553, 555, and one of 471 or 473.

3.13 Professional Diplomas in Community Rehabilitation and Disability Studies

Introduction

Community Rehabilitation and Disability Studies sponsors a post-degree program leading to a Diploma of the Cumming School of Medicine with a specialization in Community Rehabilitation and Disability Studies for those who are working in the field of community rehabilitation and disability studies or wishing to transfer their current professional training to community practice. The diploma program provides the foundation interdisciplinary skills identified by the field as necessary for practice. The diploma will also assist students in meeting the entrance requirements of the Pan Canadian Master's Degree program in Community Rehabilitation and Disability Studies.

Admission

An approved degree with a grade point average of at least 2.50 over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) (University of Calgary courses and/or transferable courses taken at other institutions). All grades within

a term will be included except where the number of courses taken within a term exceeds that required to fulfill (to a maximum of) 30 units (5.0 full-course equivalents), in which case the highest grades will be used.

Experience and/or undergraduate work in helping professions.

An interview with the Director, Community Rehabilitation and Disability Studies or representative to discuss program requirements and to complete program forms. Students must provide copies of their transcripts before or during this interview.

An approved program. Applicants will not be registered until such time as the diploma program has been approved and formal admission to the program has been granted.

Requirements

Specific courses will vary depending on the program (see below).

1. Students must complete a minimum of 24 units (4.0 full-course equivalents) satisfying departmental requirements. Programs are developed on an individual basis.

2. A grade point average of 3.00 or better is required on the 24 or 30 units (4.0 or 5.0 full-course equivalents) on the diploma program. (All courses taken subsequent to admission will be included in the calculation.) A grade below "C" will not be accepted for credit on a diploma program. The program must be completed within four calendar years. Relevant courses taken prior to admission (e.g., as an Open Studies student) may be allowed for credit toward the diploma; however, the date of the first course credited toward the diploma will indicate the commencement of the four-year time limit.

Notes:

1. Students from developing countries or partnered universities may be admitted under contracted agreements.

2. Applicants new to the University of Calgary must complete an Application for Admission form and supply official transcripts; former University of Calgary students who have attended during the past year must complete a Change of Program form.

3. Courses credited in a completed diploma may not be used for credit towards the BCR degree or any other graduate degree.

4. Those intending to apply for admission to the Faculty of Graduate Studies are advised that a full-time diploma year will not count as the equivalent of a residence year in the MEd or MSc degree programs.

3.14 Interprofessional Practice in Health Care Courses

The Faculties and Departments of Medicine, Social Work, Nursing, Community Rehabilitation and Disability Studies, Psychology and Education, along with the Alberta Health Region jointly sponsor courses in Interprofessional Health Education (IPHE). The courses provide the foundation for sound and evidence-informed interprofessional practice in the fields of health and mental health and addictions where comorbidity is common. Interprofessional Health Education 501 and 503 may be taken by Community Rehabilitation and Disability Studies undergraduate students and credited as a senior social science option course toward the Bachelor of Community Rehabilitation degree program.

4. Bachelor of Health Sciences Honours

4.1 Summary of Programs

Co-ordinated by the Cumming School of Medicine and in co-operation with the Faculties of Science and Arts, the Cumming School of Medicine offers an undergraduate degree in Health Sciences, the Bachelor of Health Sciences Honours (BHSc Honours), consisting of three majors (Bioinformatics, Biomedical Sciences, and Health and Society). (Details on majors are given in 4.5 Program Details). Because of the admissions standard and GPA requirements, it is expected that most students will attain Honours standing. However, those students who progress to the fourth year but do not attain a cumulative GPA of 3.30 over the last 90 units (15.0 full-course equivalents) will graduate with a BHSc. The BHSc Honours degree will normally take four years. Students are selected through an admissions process and have direct entry into the first year. The deadline to apply for admission is March 1. Admission offers will be made by mid-April.

A Health Sciences Minor is available in Health and Society. (Details are given in 4.5 Program Details.)

4.2 Faculty Student Affairs

Inquiries related to Faculty Regulations (Section 4.3), BHSc Admissions (Section 4.4) and BHSc course requirements (Section 4.5) should be directed to the Program Co-ordinator in the O'Brien Centre for the BHSc Office.

4.3 Faculty Regulations

Students in the Cumming School of Medicine are governed by the regulations in this section of the Calendar as well as by the general University regulations in the sections titled Undergraduate Admissions and Academic Regulations. For the precise interpretation of any statement or regulation, students should feel free to contact the Associate Dean (Undergraduate Health and Science Education), the O'Brien Centre for the BHSc Office, Cumming School of Medicine. The Associate Dean (UHSE) is responsible for all undergraduate BHSc student affairs in the faculty.

Enrolment Limitations

Enrolment limits may be in effect for some courses in the Cumming School of Medicine and the Faculties of Science and Arts.

4.3.1 Degree Requirements

The following general requirements apply to all undergraduate bachelor degree programs in the Cumming School of Medicine:

Degree Programs

In order to graduate, a student must present an approved list of courses completed with passing grades. This list will be referred to as the Major. The Major must satisfy the following conditions:

(a) The Major must contain at least 120 units (20.0 full-course equivalents) with at least 66 units (11.0 full-course equivalents) numbered 300 or above.

(b) Only 3 units (0.5 full-course equivalent) in the Major may be graded a "D" or "D+".

(c) A minimum GPA of 3.60 over the last 90 units (15.0 full-course equivalents) will be eligible for a First Class Honours designation. Refer to "First Class Honours" requirements.

(d) A minimum GPA of 3.30 must be maintained over the last 90 units (15.0 full-course equivalents) for an Honours designation.

(e) Please refer to 4.3.4 Student Standing for a description of "satisfactory standing".

(f) No more than 60 units (10.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be included in the degree.

(g) Candidates for Honours have a maximum of five years in which they are registered in courses to complete the required programs.

Notes:

- These requirements may change with every Calendar issue. A given Calendar entry applies to the academic year beginning on July 1 and ending on the following June 30. The time of entry into a Major in the Cumming School of Medicine is defined as the first term after admission to the Major during which a student successfully completes any courses applicable to the Major. A student's Major is subject to the course requirements that are in the Calendar current at the time of entry into the BHSc Honours, and a student is allowed five years counted from the time of entry into the Major, to graduate under these requirements. Students who exceed the allotted time limit must consult with the Associate Dean (UHSE), who will decide on an acceptable set of course requirements for graduation.
- A student who fails to maintain the necessary performance standards or who decides not to continue in the Honours degree may transfer to another faculty program, subject to that program's admission requirements.

First Class Honours

In addition to the Honours requirements, first class designation requires successful completion of a program major equivalent to 120 units (20.0 full-course equivalents) with a GPA of at least 3.60 over the last 90 units (15.0 full-course equivalents). A student who has taken part of their course work at another university may be granted a degree with First Class Honours at the discretion of the faculty.

Minor Programs

A Minor is available in Health and Society. The course requirements are listed in 4.5.4 Program Details. The GPA over all courses counting towards the Minor must be at least 2.00.

4.3.2 Course Selection and Registration

Accuracy of Registration

Students are responsible for ensuring that their annual course selections are in accordance with all Calendar requirements, including the completion of prerequisite courses with a satisfactory grade and registration in corequisite courses as appropriate. Students are advised not to register in a course unless they have achieved a grade of at least "C-" in each prerequisite course. It is the responsibility of students to ensure that they meet all prerequisite requirements. A student who has received credit for a course without having the normal prerequisite course(s) may not subsequently register in the prerequisite course(s) for program credit. Taking or repeating a course that is a prerequisite for a higher level course after having completed the higher level course with a grade of "C-" or better will only be allowed with the permission of the Associate Dean (UHSE). Registration in any course(s) contrary to regulations may be cancelled by the faculty after the beginning of classes. Registration must be appropriate to the major being followed. Students with inappropriate course selections may have their registration cancelled by the Associate Dean (UHSE). Students should seek advice from the Associate Dean (UHSE) or the BHSc Program Co-ordinator.

Students are responsible for ensuring that they meet degree and program Major requirements. Although the BHSc Office endeavours to assist all students as they proceed in the various Majors, a final and thorough check is not done until application for graduation. Any departure from standard requirements must receive prior authorization in writing from the Associate Dean (UHSE). It is strongly recommended that students consult with the Associate Dean (UHSE) or the BHSc Program Co-ordinator before submitting their final registration.

First-year students should obtain a copy of the Course Registration and Planning Guide from the Office of the Registrar or visit ucalgary.ca/registrar.

Withdrawal from Courses

Students will not be permitted to withdraw more than once from a particular course. Students will be required to withdraw from the Cumming School of Medicine if they have accumulated a total of more than 30 units (5.0 full-course equivalents) withdrawals while in attendance at the University of Calgary. A student who wishes to withdraw from a course must do so before the deadline specified in the Academic Schedule. Students should consult with the BHSc program prior to withdrawing from a course.

Repetition of Courses

A student will be permitted to repeat a particular course only once. This regulation applies not only to individual courses but also to sets of courses where it is stated that credit for more than one of the sets is not allowed. A withdrawal counts as an attempt.

Opportunities to Take Courses at Another Institution for Transfer of Credit

Students may request to take some program course work at another university. Students are advised to meet with the Program Co-ordinator to receive the necessary approved Letter of Permission to undertake course work at another university. It will be the responsibility of the student to ensure that an official transcript of grades is forwarded directly to the Registrar of this University in order that appropriate credit may be officially recorded.

Credit in Courses by Special Assessment

Students who feel that they know the material covered in a certain course without having received formal University credit may apply for special assessment in the course. Students should obtain the form headed "Permission to Take Courses by Special Assessment" from the Office of the Registrar and submit their application to the faculty offering the course. A course in which the student was previously registered may not be taken subsequently by special assessment, nor may any course be attempted more than once in this way. The faculty will not allow more than 30 units (5.0 full-course equivalents) completed by special assessment to count towards a degree. See also the general University regulations concerning special assessment (see B.10.1 in Academic Regulations).

4.3.3 Assessment

Missed Components of Term Work

Any student who is absent from a test or fails to complete a laboratory assignment or similar work for legitimate reasons must discuss an alternative course of action with the instructor. The regulations covering such circumstances are outlined in the sections E.3 Attendance and G.7 Deferral of Term Work in the Academic Regulations section of this Calendar. In such cases, the instructor must be notified within 48 hours.

Deferral of Final Examination

See the general University regulations governing the deferral of final examinations. In order to apply for a deferral of a final examination, students must pick up an application form in the Office of the Registrar or download it from the Registrar's website at ucalgary.ca/registrar/exam_info and submit the completed form to the Associate Dean (UHSE). Students seeking a deferment of a final examination for medical reasons must submit a Physician/Counsellor Statement form, which they can obtain from the Office of the Registrar or download from the website. A medical certificate stating only that a student has been seen by a physician is insufficient. Misreading the examination timetable is not a valid reason for requesting a deferred final examination.

4.3.4 Student Standing

Performance Review, Probationary Status and Dismissal

The academic standing of each student registered in the faculty will be reviewed annually following the Winter Term as per the GPA Requirements table.

GPA Requirements

End of Year 1	Year 2 and 3	Year 4 and Graduation
3.30 or above: satisfactory standing	3.30 or above: satisfactory standing	3.30 or above: BHSc Honours degree
2.75 - 3.29: continuation in BHSc	2.75 - 3.29: continuation in BHSc	2.75 - 3.29: BHSc degree
1.70 - 2.74: continuation in BHSc on probation (see note 1)	1.70 - 2.74: On Probation (see note 1)	1.70 - 2.74: no degree (see note 2)
0.00 – 1.69: Required to withdraw from the faculty	0.00 – 1.69: Required to withdraw from the faculty	0.00 – 1.69: Required to withdraw from the faculty

Notes:

1. University regulations permit students to be on probation only once during their degree. Therefore, students who merit placement on academic probation will have to maintain a GPA of at least 2.75 in each subsequent year in order to continue in their chosen program. Students who do not meet this will be required to withdraw from the Bachelor of Health Sciences program and, if qualified, may be able to enter another program at the University of Calgary.

2. At the time of graduation, students who have not achieved a GPA of 3.30 over the last 90 units (15.0 full-course equivalents) will be awarded a BHSc (i.e., without Honours), provided that the minimum cumulative GPA attained is greater than or equal to 2.75.

3. Any students wishing to appeal an academic ruling please see section I.4 for details.

Dean's List

The Dean's List recognizes the outstanding academic achievement of students. To be included, a student must achieve a grade point average of at least 3.60 over all University of Calgary courses taken in the preceding Fall and Winter Terms, with a minimum of 30 units (5.0 full-course equivalents) to be counted. A statement of inclusion on the Dean's List will be recorded on the student's transcript. Students on academic sanction are not eligible for the Dean's List.

4.4 Admissions

Admission to the Faculty involves at the same time admission to one of the three program majors. If the applicant is not admitted to the BHSc Honours, the ap-

plication will be reviewed for admission to an alternative University of Calgary degree program designated by the applicant. Please see below regarding admission of transfer students into the second year of the BHSc Honours. If an application is unsuccessful, a new application (including a new supplementary application) must be submitted the following year.

There are approximately 100 first year students granted admissions each year from the various Majors. Admission to these majors is based both on the admission requirements listed below and the Supplementary Application results.

Applicants must submit both a completed Bachelor of Health Sciences Supplementary Application and a University of Calgary Application for Admission. Students are directed to the online Supplementary Application once their main University of Calgary online application is submitted to the Bachelor of Health Sciences program.

Year 1 Admission

Admission to Year 1 is normally limited to those who meet the requirements set out below and have completed no more than 6 units (1.0 full-course equivalent) transferable courses from a recognized post-secondary institution. Those with more than 6 units (1.0 full-course equivalent) may be required to apply to Year 2.

(a) Final transcript deadline: August 1

(b) To be considered for admission applicants must present:

(i) In progress or completed marks for the following subjects (or equivalent)

- English Language Arts 30-1
- Mathematics 30-1 or Pure Mathematics 30 with a minimum grade of 70 per cent
- Biology 30
- Chemistry 30
- One course from Group A, B, C or D as defined in A.2 in the Undergraduate Admissions section of this Calendar

(ii) Online Supplementary Application

(c) Admission is competitive. Approximately 100 first year students across the three majors are admitted each year. Therefore, meeting the minimum standards as set out in (b) does not guarantee admission. Those with more than six units (1.0 full-course equivalents) transferable courses may be required to apply to Year 2.

(d) **Applications will only be accepted electronically.** The supplementary application is to be submitted online. Applicants will be selected based on their academic qualifications and their supplementary application.

(e) An Admissions Committee will review applications and all applicants will be informed of their status through the applicant's Student Centre on their MyUofC.

(f) The O'Brien Centre for the BHSc will consider applicants for Early Admission for the upcoming year in April. Incomplete files will not be reviewed. Applicants currently in high school should refer to Early Admission for High School Students in A.5.1.1 in the Undergraduate Admissions section of this Calendar for details. It is to the applicant's advantage to apply for admission and submit the supplementary information as soon as possible.

Year 2 Admission

(a) Transcript deadline: June 30

Summer Term (Spring/Summer Intersession) courses completed in the year of application will not be considered.

(b) Admission is competitive and seats are limited. Transfer students must have completed at least 24 units (4.0 full-course equivalents). Applicants must have taken a minimum four of the following courses corresponding to the major applied to.

Biomedical Sciences Major

Biology 241, 243, Chemistry 201, 203, Mathematics 249 (or 265), Physics 211 (or 221), 223

Bioinformatics Major

Biology 241, 243, Computer Science 231 (or 217), 233 (or 219), Mathematics 265 (249), 267, Chemistry 201, 203

Health and Society Major

Biology 241, 243, Community Health and Society 201, any 200-level half course English or Comparative Literature 203, and three of Psychology 200, 201, Sociology 201, Anthropology 203, Geography 205, 251, Economics 201*, 203*, any 200-level Political Science course, Community Rehabilitation 205, 207

**Students considering the Health Economics concentration in the BHSc Honours are required to complete both Economics 201 and 203, as they are prerequisites for most 300-level Economics courses.*

(c) Subject to (b) above, a maximum of approximately 10 transfer students will be admitted into the second year of the program.

(d) **Applications will only be accepted electronically**. The supplementary application is to be submitted online. Applicants will be selected based on their academic qualifications and their supplementary application.

(e) An Admissions Committee will review applications and all applicants will be informed of their status through the applicant's Student Centre on their MyUofC.

(f) The O'Brien Centre for the BHSc will start processing applications for the upcoming year once a final and official post-secondary transcript, to include the most recent semester finished, is received. Incomplete files will not be reviewed. It is to the applicant's advantage to apply for admission and submit all necessary transcripts, including the supplementary information, as soon as possible.

(g) Transfer students who are admitted are required to take all Inquiry courses except for Medical Science 203 and Medical Science 205 – inquiry for first year students. Medical Science 203 and 205 will be replaced with an open option.

4.5 Program Details

4.5.1 Biomedical Sciences Major

Required Courses:

- Biology 241, 243
- Chemistry 201, 203, 351, 353
- Physics 211 or 221, 223
- 3 units (0.5 full-course equivalent) English (any 200-level English or Comparative Literature 203)
- Mathematics 249 or 265
- Biochemistry 393
- Medical Science 341, 351, 407
- Medical Science 203, 205, 308, 408 (Inquiry Courses to be taken in sequence through years one to three)
- Medical Science 508 (Research Project to be taken in final year). The research project is worth 12 units (2.0 full-course equivalents) and is offered over two terms.
- 3 units (0.5 full-course equivalent) Humanities Elective*
- 9 units (1.5 full-course equivalent) Open Options
- 9 units (1.5 full-course equivalent) Biomedical Option - (any senior-level course offered by the Cumming School of Medicine, Faculty of Science or select senior-level courses offered by the Faculty of Arts**)
- 15 units (2.5 full-course equivalent) Core Option (Medical Science 321, 401, 402, 404, 415, 417, 419, 501, 503, 515, 519, 521, 541, 543, 545, 561, 565, 569 and any Biochemistry course or any Cellular, Molecular and Microbial Biology course. Note: Medical Science 402 and 417/419 cannot be taken in the same year as Medical Science 508.
- 12 units (2.0 full-course equivalent) Senior Option: any course at the 300 level or above

**Acceptable courses from the Faculty of Arts to satisfy the Humanities Elective may be selected from the following departments:*

Classics and Religion; English; French, Italian and Spanish; Linguistics, Languages, and Culture; Philosophy; and Medical Science 307.

***Acceptable courses from the Faculty of Arts to satisfy the Biomedical Option are:*

Anthropology 311, 413, 435, 451, 523, 525, 552, 553, 589

Archaeology 417, 523, 555, 589, 595

Geography 339, 357, 439, 457, 533

Psychology 312, 365, 369, 375, 407, 411, 451, 455, 463, 465, 467, 469, 471, 473, 475, 477, 478, 479, 497, 591.

Other courses from the Faculty of Arts may be considered on a case by case basis with the approval of the Biomedical Sciences Director.

4.5.2 Bioinformatics Major

Required Courses:

- Biology 241, 243

- Chemistry 201, 203, 351, 353
- Mathematics 265 or 249, 267
- Statistics 321, 323
- Computer Science 102 (Block Week - highly recommended), 217 or 231, 219 or 233[1], 319, 335
- 6 units (1.0 full-course equivalent) senior-level Computer Science Option
- Medical Science 341, 351, 401, 519, 545
- Biochemistry 393
- Medical Science 203, 205, 308, 408 (Inquiry courses to be taken in sequence through years one to three)
- 3 units (0.5 full-course equivalent) Humanities Elective*: English 200-level, Philosophy 279 or Medical Science 307 (highly recommended)
- Medical Science 508 (Research project to be taken in final year). The research project is worth 12 units (2.0 full-course equivalents) and is offered over two terms.
- 3 units (0.5 full-course equivalent) Bioinformatics Option - (any senior-level course offered by the Faculty of Science, or Biomedical Engineering 515, or senior-level Medical Science courses)
- Software Engineering 301
- 6 units (1.0 full-course equivalent) Core Option: Medical Science 402, 404, 417, 419, 507, 509, 528, 545, Biochemistry 443 and Computer Science 433, 449, 481, 503, 531, 572, 583 Note: Medical Science 402 and 417/419 cannot be taken in the same year as 508.
- 3 units (0.5 full-course equivalent) Open Option
- 6 units (1.0 full-course equivalent) Senior Option: any course at the 300 level or above

[1]Students with programming experience may register in Computer Science 235 in place of 231, 233. Students selecting this option must have approval from the Department of Computer Science. If a student does complete Computer Science 235, 3 units (0.5 full-course equivalent) may be taken as an open option.

**Acceptable courses from the Faculty of Arts to satisfy the Humanities Elective may be selected from the following departments: Classics and Religion; English; French, Italian and Spanish; Linguistics, Languages, and Culture; and Philosophy or Medical Science 307.*

4.5.3 Health and Society Major

Upon completion of Year 1, Health and Society students are required to declare an "Area of Concentration". This must be selected from Anthropology, Community Rehabilitation and Disability Studies, Economics, Psychology, Geography, Sociology, or Political Science. Course selection must correspond to the student's chosen concentration discipline and must be chosen from the "Concentration Courses" listed below.

Required Courses:

- Health and Society 201, 301, 311, 401, 591
- Biology 241, 243
- 9 units (1.5 full-course equivalent) Major Option (Anthropology 203, Community Rehabilitation 205, 207, Economics 201, 203[2], Geography 205, 251, any 200-level Political Science, Psychology 200, 201[1], Sociology 201)
- 3 units (0.5 full-course equivalent) Life Sciences Option (Any Biology course or Medical Science 341 or Kinesiology 251 or Anthropology 201 or Archaeology 203)
- 3 units (0.5 full-course equivalent) English (any 200-level English or Comparative Literature 203)
- 21 units (3.5 full-course equivalents) Concentration Courses (see below)
- 9 units (1.5 full-course equivalents) Open Option
- Medical Science 203, 205, 308, (Inquiry courses to be taken in sequence through years one to two); Health and Society 408 (to be taken in year three)
- Medical Science 407
- Medical Science 508 (Research project to be taken in final year). The research project is worth 12 units (2.0 full-course equivalents) and is offered over two terms.
- 3 units (0.5 full-course equivalent) Humanities Elective*
- 12 units (2.0 full-course equivalents) Health Science Option - (any senior-level course offered by the Faculty of Science, the Cumming School of Medicine or courses selected from Anthropology, Archaeology, Economics, Geography, History, International Relations, Linguistics, Indigenous Studies, Political Science, Psychology, Sociology, Urban Studies)
- 6 units (1.0 full-course equivalent) Senior Option

[1]Students considering concentrating in psychology should take Psychology 200 and 201. It is strongly recommended that this course is completed during the first year of study to facilitate enrolment in senior-level Psychology course come the student's second year.

[2]Students considering concentrating in economics should take Economics 201 and 203. It is strongly recommended that these two courses are completed during the first year of study to facilitate enrolment in senior-level Economics course come the student's second year.

**Acceptable courses from the Faculty of Arts to satisfy the Humanities Elective may be selected from the following departments:*

English; French, Italian and Spanish; Classics and Religion; Linguistics, Languages, and Culture; Philosophy; Medical Science 307.

CONCENTRATION COURSES**

ANTHROPOLOGY

Anthropology 341, 391, 393, 411 and 9 units (1.5 full-course equivalents) from Archaeology 305, 589, 595 or senior-level courses offered by the Department of Anthropology or Archaeology.

COMMUNITY REHABILITATION AND DISABILITY STUDIES

Community Rehabilitation 209, 425, one of 471 or 473 or 475 and 12 units (2.0 full-course equivalents) senior-level Community Rehabilitation courses.

ECONOMICS

Economics 337, 355, 379 and 12 units (2.0 full-course equivalents) senior-level courses by offered by the Department of Economics.

Students considering a concentration in Economics should take Economics 201 and 203 as Major options. It is strongly recommended that these two courses be completed during the first year of study to facilitate in senior-level Economics courses come the student's second year.

GEOGRAPHY

Geography 231, 251, and 339 and 12 units (2.0 full-course equivalents) Senior-level courses offered by the department of Geography

POLITICAL SCIENCES

Political Science 310, 359, 381, 399 and 6 units (1.0 full-course equivalent) Senior-level courses offered by the Department of Political Sciences

PSYCHOLOGY

Psychology 312, and 305 or 405 and 12 units (2.0 full-course equivalents) Senior-level courses offered by the department of Psychology.

Students considering a concentration in Psychology should take Psychology 200 and 201 as Major options. It is strongly recommended that this course be completed during the first year of study to facilitate in senior-level Psychology courses come the student's second year.

SOCIOLOGY

Sociology 311, 313, 315, 321, 331, 333, 413

***The above concentration courses are subject to the changes and restrictions of the department offering the course.*

4.5.4 Health and Society Minor

A Minor is available in Health and Society. The GPA over all courses counting towards the minor must be at least 2.00.

A maximum of 50 students will be admitted into the Minor each calendar year. Students will be selected top down based on GPA over their last 30 units (5.0 full-course equivalents). Admission to the Minor will be offered to students once Fall and Winter Term grades have been received.

Students must declare their intention to Minor in Health and Society after having taken a minimum of 24 units (4.0 full-course equivalents).

Students should apply to the Minor program through their Student Centre. Students should refer to the application deadline in the Undergraduate Admissions section of the Calendar.

12 Units (2.0 full-course equivalents):

Health and Society 201, 301, 311, 401

18 Units (3.0 full-course equivalents) selected from:

Anthropology 203, 341, 349, 391

Archaeology 305, 589, 595

Community Rehabilitation 205, 207, 209, 415, 425, 471, 473, 475, 485, 487, 591.26, 591.28,

Economics 201, 203, 337, 349, 355, 377, 379

Geography 251, 351

Psychology 200, 201, 351, 353, 375, 385

Sociology 201, 321

Notes:

1. Students may not use courses in fulfillment of both Major and Minor requirements.

2. Students must complete enough senior-level courses to fulfill the requirements of their Major.

3. Students should note that many of these courses have prerequisites and must be taken into consideration when planning their program.

4. Some of the above courses may be restricted to Majors in the field and students may not have enrolment priority in heavily subscribed courses.

5. Students who are pursuing an Honours degree may consider a cross-disciplinary Honours thesis and should consult with their supervisor regarding opportunities in this area.

6. Other courses may be approved to fulfill the 18 units (3.0 full-course equivalents) at the discretion of the Director of Health and Society. Students should contact the BHSc Co-ordinator, Student Affairs for more information.

5. Doctor of Medicine

The Cumming School Medicine of the University of Calgary offers a three-year professional degree leading to a Doctor of Medicine (MD).

Following completion of the undergraduate medical program students must complete postgraduate medical training prior to starting independent practice. They need to obtain certification from the College of Family Physicians of Canada (a minimum of two additional years of training) or a Royal College of Physicians and Surgeons of Canada program (a minimum of four additional years of training). The University of Calgary has more than 60 residency training programs.

Full details can be found on the Cumming School of Medicine Postgraduate Medical Education website at ucalgary.ca/pgme.

Leaders in Medicine Combined MD/PhD or MD/MSc Program

The Cumming School of Medicine offers a combined degree program with the Faculty of Graduate Studies leading to various MD/graduate degrees (i.e. MD/MSc, MD/MBA and MD/PhD) in all Cumming School of Medicine graduate programs and with permission in other University of Calgary graduate programs. Information can be obtained under the Leaders in Medicine heading in the Faculty of Graduate Studies section of this calendar, and in the sections describing the individual CSM graduate programs. Supplementary application forms can be obtained from the Leaders in Medicine Program office (Graduate Sciences Education) in the Cumming School of Medicine.

5.1 Faculty Information

Contact Information

Location: Undergraduate Medical Education Office, Health Science Centre G701

MD Program main reception number: 403.210.3841

Website: ucalgary.ca/mdprogram/

Student Affairs

The Office of Student Affairs encourages students to strive for balance in their academic and personal lives. Our office is here to help support you throughout the next three years of training and we encourage students to utilize our completely confidential services. We offer medical, emotional, academic and career counseling assistance; we are always available to help you. We strive to create a supportive environment to help promote positive growth and development as students transition into well-rounded medical professionals.

Contact Information:

Location: Health Sciences Centre G740

Main Reception Number: 403.220.4262

Office Hours: 8:30 am – 4:30 pm

Website: ucalgary.ca/mdprogram/current-students/student-affairs

Parking and Transportation Services

Students can apply for on-site parking through the Alberta Health Services Parking Office as follows:

Women's Health Centre, Room 060

Foothills Medical Centre

Business Hours: 8:00 a.m. – 4:00 p.m.

Monday to Friday (closed on holidays)

Phone: 403.944.1014

Alberta Health Services also operates a parking call centre with assistance from live operators available 24 hours per day, seven days per week. The toll-free call centre number is included on the parking information sheets and is also posted on all parking equipment. Please call us anytime to obtain general parking information, report a maintenance or equipment problem, or to obtain assistance with equipment operation. Call 1-855-535-1100.

Email: ProvincialParking@albertahealthservices.ca

Website: albertahealthservices.ca/info/Page12576.aspx

Map of Foothills Site: albertahealthservices.ca/assets/info/park/if-pmap-foothills-medical-centre

5.2 Pattern of Education

The curriculum at the Cumming School of Medicine follows an innovative "Clinical Presentation" curriculum. Curriculum content including basic and clinical sciences is organized around the 120 +/- 5 ways a patient can present to a physician. These clinical presentations can take the form of historical points (e.g. chest pain), physical examination signs (e.g. hypertension), or laboratory abnormalities (e.g. elevated serum lipids).

The organization by clinical presentations allows for a comprehensive approach to patient problems. Collaboration with multidisciplinary colleagues is incorporated, with emphasis on the physician as a member of the health care team. Elective opportunities allow students to explore areas of interest in greater depth, including clinical interests, research topics, and international health.

Medical students are exposed to patients from the time they enter the Cumming School of Medicine. This is facilitated by the Cumming School of Medicine's associations with inpatient and outpatient settings throughout Calgary and Alberta. In these settings, students are able to participate in patient care and a team approach to health care delivery from the first day they enter medical school.

The curriculum maintains an active learning environment. In the first two years, more than 25 per cent of scheduled instructional activities are spent in small group, case-based learning sessions. These small group sessions allow a unique opportunity for students to create an approach to problem solving using diagnostic classification schemes, to analyze the objectives and content from lectures in an in-depth fashion, and to communicate and exchange feedback with faculty and peers. Student attendance at small group sessions is considered mandatory.

The third and final year is called the Clinical Clerkship. During this time, students work on hospital wards, in ambulatory care clinics and doctors' offices as well as in the Emergency Department in Calgary and Southern Alberta. Students rotate through a variety of specialties including Emergency Medicine, Family Medicine, Internal Medicine, Surgery, Psychiatry, Paediatrics, Anaesthesia, and Obstetrics and Gynaecology. Students also have 12 weeks of elective experience in the clerkship year.

The Undergraduate Medical Education program employs electronic-based materials in lectures, small groups, and other learning events. As such a laptop computer is strongly recommended for all students.

Participation in Rural Rotations: In the Faculty's response to rural social accountability, the program provides teaching at several regional centres such as Medicine Hat, Lethbridge, Red Deer, Yellowknife and rural sites such as Brooks, High Level and Pincher Creek, etc. Students should expect to do a minimum of 5–10 weeks of their clinical experience (pre-clerkship and clerkship) outside the city of Calgary except in unusual circumstances. A longitudinal placement at a rural site in the clerkship year provides a further option for a longer rural training experience for interested students.

5.3 Admissions

Applicants to the Cumming School of Medicine should ensure that they have also read the Office of Admissions' Applicant Manual. For current information, please visit the website at ucalgary.ca/mdprogram/admissions.

Pre-Medicine

The Cumming School of Medicine does not require that a student undertake a formal pre-medical program. There is no preferred degree.

Eligibility for Admission

The number of positions for students at the University of Calgary medical school is currently limited to 155 Canadian students. This number may increase or decrease slightly over the next several years due to physical capacity and funding availability. As a provincial university, the University of Calgary has a primary obligation to Canadian citizens residing in Alberta. Although priority will be given to Alberta residents, the Faculty also invites applications from residents of other provinces.

The Cumming School of Medicine has a policy on the admission of candidates who are neither Canadian citizens nor landed immigrants. The Faculty does not accept applications from individual international students. Seats for international students are currently limited to students from institutions or countries that have formal, contractual agreements with the Cumming School of Medicine.

In selecting medical students, no preference is given to the gender, race, religion, or socio-economic status of the applicant. Nor is the vocation of his or her parent, guardian, or spouse a consideration in the selection process.

Physical disabilities must not prevent the student, upon graduation, from communicating with patients, making observations, gathering and analysing data necessary to arrive at medical judgments, and from performing the therapeutic interventions expected of a physician who has completed the educational program leading to an MD degree.

The Cumming School of Medicine will not normally accept applications from students who have withdrawn, who have been required to withdraw, or who have been expelled from any school or college of medicine.

Educational Background

Students must have completed a minimum of two full years of university-level courses at the time of application. Most students will have completed a baccalaureate degree before admission to the Cumming School of Medicine.

Note: The Cumming School of Medicine's definition of a full year is described in the Office of Admissions' Applicant Manual. Refer to the manual for the most accurate information on requirements. The Applicant Manual is available at ucalgary.ca/mdprogram/admissions.

The Cumming School of Medicine does not require that students undertake a formal pre-medical program. No specific courses are required for application or acceptance to the MD program. The admissions committee recommends that applicants consider taking as many of the courses listed in the Applicant Manual as their schedules allow, as the content of these courses will be helpful in preparing for the Medical College Admission Test and during the MD program. Whether or not an applicant has taken these courses at the time of application will not be taken into consideration in scoring the academic record. Students should ensure that the courses they choose satisfy the degree requirements of the undergraduate faculty in which they are registered.

Admission/Registration Refusal

The University of Calgary reserves the right, the published regulations notwithstanding, to reject applicants for admission or registration in courses on the basis of their overall academic records (even if they technically meet the entrance requirements), and on medical and other grounds.

Admissions Committee

The Admissions Committee of the Cumming School of Medicine of the University of Calgary consists of representatives of the medical faculty, student physicians, the medical community, other disciplines, and the community at large. The committee is charged with the selection of medical students on the basis of academic and non-academic qualifications. The committee chooses these applicants on the basis of academic and non-academic criteria as described in the Applicant Manual, which can be found at: wcm.ucalgary.ca/mdprogram/admissions.

Medical College Admission Test

All applicants must have written the Medical College Admission Test as of the time of application. MCAT scores will then be available to the Admissions Committee when considering applications. Applicants should contact the MCAT Program Office (aamc.org/mcat) for details about the test and they must instruct the organization to release their MCAT results to the University of Calgary.

Applicants to the Cumming School of Medicine should also be aware that only the new MCAT exam will be accepted. This version is also known as the MCAT2015, which consists of four sections, and was launched in the Spring of 2015.

Applications

Applications for the MD program are available on the website. Applicants may obtain an application by visiting ucalgary.ca/mdprogram/admissions. All applications must be submitted online. The deadline for receipt by the Office of Admissions of the online application, all official transcripts, official MCAT scores, three letters of reference, and the application fee of $150.00 is posted on our website.

Applicants should note that the Office of Admissions will not accept electronic nor facsimile transmission copies of transcripts. The work of the committee is greatly facilitated when candidates submit their applications early in the process, preferably well before the deadline. It is the responsibility of the applicant to ensure that the application is complete and that all necessary forms and the application fee are received by the Office of Admissions by the deadline. Completed applications include the following information: a list of courses taken and grades obtained; MCAT scores and the date of writing (if available); a brief description of experiences; employment activities and three letters of reference.

Note: A complete application contains all the information described in the Office of Admissions' Application Manual.

Applicants will be notified in February regarding whether or not they will be invited to attend a series of short interviews. The interviews take place at the University of Calgary in February or March.

Applicants must attend the interviews at their own expense. Applicants must take part in a series of short, back-to-back interviews, which the committee will use to assess the candidates' non-cognitive qualifications.

Applicants will be notified of the Admissions Committee's decision no later than May 15. All applicants accepted into the Cumming School of Medicine will be required to forward a $1000.00 deposit within the time specified in the acceptance letter. Failure to do so may result in the position being assigned to an applicant on the waiting list. The deposit is applied to first year fees. An applicant who accepts a position and later withdraws his or her acceptance will forfeit the deposit.

All medical students must commence a program of immunization before registration day. The Cumming School of Medicine reserves the right to refuse admission to any candidate whose condition of health indicates that medical studies could be prejudicial to their well-being or that of patients.

Admission of Students by Transfer

Because the three-year MD program at the University of Calgary is regarded as a continuum, transfers cannot be considered. For the final clerkship year, students from other LCME Accredited Medical Schools may apply for visiting student status if there are sufficient resources at the University of Calgary such that the visiting student will not displace University of Calgary students.

5.4 Program Details

Schedule of Classes and Timetable

The schedule of classes offered in each year of the MD Program is available online in the student scheduling system OSLER. In exceptional circumstances changes may be made to a student's timetable to meet the schedule of the program. Schedule of detailed class information is available in the online student schedule in OSLER at: osler.ucalgary.ca/.

Students should refer to the online schedule in OSLER to ensure that they are not scheduling extracurricular events or overlapping with scheduled class time. In addition, master timetables of the curriculum can be found online. Refer to this link for the most updated version of the general timetable: ucalgary.ca/mdprogram/current-student/timetables-0.

Timelines

Year 1: July – March (9 Months)

Year 2: April – February (11 Months)

Year 3: February – April (13 Months)

Curriculum Requirements (Core Courses)

Year 1: Medicine 320, 330, 340, 350, 360, 370

Year 2: Medicine 402, 410, 420, 430, 440, 450, 460, 470, 480, 490

Year 3: Medicine 502, 504, 506, 508, 510, 512, 514, 516, 520, 522

For a complete listing and description of all courses offered in the MD Program, please refer to the "Courses of Instruction" section of the University Calendar.

ucalgary.ca/pubs/calendar/current/medicine.

Program Extensions

Students are allowed to request a program extension through the Student Academic Review Committee (SARC). Process for these requests is outlined in the SARC Terms of Reference, Appendix, Section E as found in: vp.ucalgary.ca/images/policies/aasarctormarch112015approvedbyfacultycouncilmarch112015ss. Extensions may be allowed in the clerkship year (Year 3 of Program) as a result of a student failing to be matched in the Canadian Resident Matching Service (CaRMS) residency match.

Maximum Time Allowance to Complete the Curriculum

Students are required to complete the first two years of the MD curriculum within no more than four years from the initiation of studies, and complete the third clerkship year within two years after the completion of the first two years of study. Exceptions are made for students formally enrolled in the MD/PhD or MD/MSc Programs, where the maximum time allowed for the completion of the combined programs is eight and six years respectively. Exceptions may be made in other unusual circumstances.

Approved leaves of absence (single or cumulative) may extend the time to complete the curriculum by no more than two years beyond the maximum time allowances.

Please refer to the Student Academic Review Committee (SARC) Terms of Reference for further information at: vp.ucalgary.ca/images/policies/aasarctormarch112015approvedbyfacultycouncilmarch112015ss.

5.5 Faculty Regulations

Immunization Requirements

All MD students are required to complete a series of immunization and diagnostic tests as outlined on the Student Immunization Form Checklist. Documented proof of completion must be provided to the Associate Dean or designate prior to commencement of the program.

Throughout the MD program, students are required to ensure that immunizations are current and must provide proof of updates to the Cumming School of Medicine. Failure to do so will result in students being removed from practicum courses until such time as adequate proof has been provided. Please note requirements may change during the program as determined by Alberta Health Services guidelines.

N-95 Fit Testing

All MD students must be fit tested for an N-95 mask prior to commencement of Medicine 402 (Summer Electives). Students may be required to wear this mask in the practice setting to help protect against certain communicable diseases. Documented proof of a fit test will be available in the Undergraduate Medical Education office. Fit testing is only valid for two years; therefore students must present proof of a second fit testing at the time of expiration.

Security Clearance/Criminal Record Check

All applicants to the MD Program in the Cumming School of Medicine are required to provide a current Police Information Check (also referred to as a Criminal Record Check or Security Clearance). In order to be considered "current", the Police Information Check must be completed during the three months prior to admission to the program. The original Police Information Check must be presented, in person, to an Undergraduate Medical Education staff for confirmation. Without this documentation, admission to the Faculty will be rescinded.

Students who are concerned about the presence of a criminal record should contact the police department to discuss the process for eliminating or erasing such a record. It is important that students keep the original Police Information Check for future employment purposes.

Failure to present a clear Police Information Check may result in admission being denied/rescinded. An internal University appeal process is available to applicants who are refused admission for this reason.

Subsequent to admission and at any time during the program, a student may be required to produce a current Police Information Check, the results of which could require their withdrawal from the program, in the sole discretion of the University. Students are obligated to inform the Faculty immediately of any change in status of their criminal record.

Policies Relative to Clinical Experience

Students are advised to read the general University regulations regarding attendance (see E.3) in the section of this Calendar headed Academic Regulations.

Students may be required to complete clinical experience at sites other than the location of their residence. Students' clinical experience may also be scheduled at various hours, including evenings, nights and weekends, **Monday through Sunday**. Medical Doctor students are responsible for all travel, parking and accommodation costs related to clinical experiences except for University of Calgary Longitudinal Integrated Clerkship (UCLIC) students.

Students must demonstrate satisfactory performance as delineated in the objectives of the course. Participation in all activities that involve patients is mandatory.

Students who miss one or more clinical days, must comply with the Undergraduate Medical Education (UME) attendance policies.

An instructor may prohibit a student from attending or completing a clinical experience if there is evidence that the student has acted in a manner that is detrimental to patient care or that patient safety is at risk. The Associate Dean will be consulted or informed about any such situation or action. A student who wishes to appeal such a decision will follow the appeals process as outlined in 5.8 Appeals Process.

Policy Relative to Student Attendance

Students are advised to read the general University regulations regarding attendance (see E.3) in the section of this Calendar headed Academic Regulations.

In addition to the academic regulations, the following attendance policies and guidelines will apply to all students in the Medical Doctor program:

- Medical Student Attendance Policy (Related to Years 1 and 2 of the MD Program)
- Guidelines for Attendance in Clerkship located in the “Clerkship Policies and Procedures Manual” (Related to Year 3 of the MD Program)
- Medical Student Leave of Absence/Time Away Policy (Related to all three years of the Program)

All documents listed above can be located on the Medical Doctor Website as follows:

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference#quickset-field_collection_quicktabs_2

ucalgary.ca/mdprogram/current-students.

Academic Accommodation Policy

It is important for students with documented disabilities, who have met the admission criteria, to note that the Academic Accommodation Policy does not require the University to lower or substantially modify standards in order to accommodate students with disabilities. Adaptive technology and/or academic accommodations are available to facilitate learning; however, they do not relieve students of their responsibilities to develop the essential skills and abilities expected of all other students.

Fees and Expenses

Tuition

Please refer to the Tuition and General Fees section of the Calendar for a breakdown of tuition and general fees for the MD Program.

Other Expenses

In addition to textbooks and course packages, students can expect other additional charges. Examples listed below:

- Uniforms
- Stethoscope
- Police Information Check
- CPR Certification/Re-certification

- Immunizations
- Travel to and from practice sites
- Parking Fees at practice sites
- Name badges
- Medical Council of Canada Examination Fees

Tuition Fee Credits

A tuition credit will be calculated by the Undergraduate Medical Education Office (UME) when a student has gone on an approved Leave of Absence from the program or has been requested to withdraw from the program. Students will not receive a refund but rather a credit note for future tuition or general fee expenses. Please note that general fees cannot be adjusted.

Student Awards

Student Awards Office

Location: MacKimmie Block 124

Telephone: 403.210.7625

Undergraduate Awards Email: ucawards@ucalgary.ca

Financial Assistance and Loans Email: financialaid@ucalgary.ca

Website: ucalgary.ca/studentfinance/

The Student Awards Office provides scholarships, bursaries and awards information to entering and continuing undergraduate students, linking them with valuable financial resources for their post-secondary studies.

Students should review the cost of attending university from their very first term through to the completion of their program. Paying for a university education is ultimately the responsibility of the student. To access financial assistance, make the necessary applications well before the start of the academic year. Be aware of the application deadlines for grants, awards and government student loans. Although each student's needs and resources differ, the University provides a list of general fees and expenses. Refer to the "Tuition and General Fees" section in this Calendar for details.

Awards specifically for medical students can be found online at:

ucalgary.ca/awards/professional-programs/md

cumming.ucalgary.ca/ruralmedicine/awards.

Graduation

Students must have successfully completed all required components of the MD program in order to Graduate.

Students will not be allowed to graduate with any failed course. The Student Academic Review Committee (SARC) of the MD Program will establish appropriate remediation requirements that must be fulfilled in order for students to obtain the standing of satisfactory performance. These remediation requirements may include repeating one or more practicum rotations, one or more entire courses, or the entire year.

Policy Resources

Clerkship Policy & Procedures Handbook:

ucalgary.ca/mdprogram/current-students

Student Evaluation Committee (SEC): Policy for Development & Maintenance of Student Evaluations & Policy for Reappraisals and Appeals of Student Evaluations:

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference

Undergraduate Medical Education Policies & Guidelines:

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference

Student Academic Review Committee: Terms of Reference:

vp.ucalgary.ca/images/policies/aasarctor-march112015approvedbyfacultycouncil-march112015ss

5.6 Course Registration

Accuracy of Registration

The Undergraduate Medical Education Office will register successful applicants admitted to the Medical Doctor Program and ongoing students into all required yearly courses. Payment of fees is the student's responsibility through the Online Student Centre via MyUofC web portal. For more information refer to B.15 Payment of Fees or Notification of Financial Assistance in the Academic Regulations section of this Calendar.

Withdrawal from Courses

Students can withdraw from courses for the following reasons:

- Academic Issues and Student Academic Review Committee (SARC) Recommendations
- Approved Leave of Absences including Medical Leaves
- Approved Withdrawal from the MD Program

Prior to the add/drop deadline, students will have the course(s) removed from their permanent record and will not be required to pay tuition fees for the course.

After the registration deadline a student will have the withdrawal recorded on their permanent record and will not receive a tuition fee credit.

The date of withdrawal from a course or from the term will be noted on the student's permanent record.

Leave of Absence

In cases of leave of absence, the Student Academic Review Committee (SARC) reserves the right to review all students who have taken leaves of absence prior to resumption of studies. The maximum duration of leave of absence without compulsory review of the student's progress by SARC is one year. If the leave of absence is in excess of one year, the student will be reviewed by SARC prior to resumption of studies. SARC may ask for the student to be reassessed prior to resumption of studies and may request the student repeat any portion of the preceding curriculum if found unsatisfactory before continuing further studies.

For more information on Leaves of Absence or Time Away, refer to: ucalgary.ca/mdprogram/current-student/policies-guidelines.

5.7 Assessment

Exceptions and further information to Assessment, evaluations and appeals can be located in the following online documentation:

- Policy for Development and Maintenance of Student Evaluations
- Policy for Reappraisals and Appeals of Student Evaluations

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference.

Scheduling of Examinations

Examinations are scheduled within regular class time except in those special cases where prior approval has been obtained from the Associate Dean of the Undergraduate Medical Education Office (UME).

Grading System

A system of grading which carries no weight in the determination of grade point averages is used by the Cumming School of Medicine for its MD Program.

CR – Completed Requirements

RM – Remedial Work Required

I – Incomplete

MT – Multi-Term

F – Fail

University policy requires that students' grades in a course are reported according to the grading scheme of the faculty giving the course (regardless of the faculty in which a student is registered) and are so recorded on students' transcripts of record.

A **Satisfactory/Unsatisfactory grading system** will be used. Students cannot be declared Satisfactory overall based upon only some of the components of an evaluation. Students must be declared Satisfactory or Unsatisfactory in the complete (overall) evaluation.

To obtain credit for a course, a student must be certified as satisfactory on the course evaluation by achieving a score at or above the minimum performance level (MPL) for the examination.

Results from Year 1 and 2 will be reported as either "Satisfactory" or "Unsatisfactory".

Results from Year 3 will be reported as "Satisfactory", "Unsatisfactory", or "Satisfactory with performance deficiency".

"Satisfactory" means that the faculty has determined that the student has met or exceeded the level of performance minimally acceptable for promotion. When a student receives a Satisfactory grade in the course concerned, the grade cannot be altered by any further changes made in the evaluation as a result of subsequent appeals.

"Unsatisfactory" means that the student has not met the minimum performance level for the evaluation. A student who is unsatisfactory may wish to review their result sheet with the examination key to aid in recognition of areas of deficiencies and assist in planning remedial studies or to identify an

error in the marking. Should a student feel that an error has occurred in the marking of a non-multiple choice question (MCQ) they may submit a Request for Reappraisal. A students can also be deemed unsatisfactory in a situation where a serious professionalism breach has occurred.

"Satisfactory with performance deficiency" is used in Clerkship for the following situations.

1. Failure of one component of a clerkship evaluation with subsequent completion of required remedial work and satisfactory performance on rewrite of that component.
2. Overall rating of satisfactory performance in a clerkship rotation but with one or more specific areas of deficiency noted including professional and ethical behaviour.

Minimum Performance Levels (MPL)

The MPL for an examination is the sum of MPLs for each item on the examination. Members of the Exam Review Working Committee set the MPL for each item.

The overall examination MPL and student results will be rounded as per the follow policy document:

Policy for Development and Maintenance of Student Evaluations (ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference).

Distribution of Results

Examination results will be distributed to each student via email to the student's @ ucalgary.ca address. Grades will be emailed only to an @ucalgary address. Paper copies of grades are not distributed to students. The emailed result will include the overall score and the examination minimum performance level. These results also indicate areas of strengths and weaknesses in each of the identifiable clinical presentations.

Examination results will be kept confidential. Individual student results will be made available to:

1. the student
2. the student's permanent file
3. the student's faculty advisor (this is accomplished by the student forwarding the emailed results to the advisor; any other distribution to the faculty advisor requires written consent of the student)
4. the office of the Associate Dean, UME
5. members of faculty committees responsible for student promotion and/or appeals
6. course chair and evaluation co-ordinator for relevant course or clerkship. Anonymized group evaluation results may be released to the course chair and evaluation co-ordinator for the relevant course and to faculty responsible for program evaluation in the Undergraduate Medical Education Program.

Individual student grades and class standings are not reported on student transcripts or provided as part of Canadian Resident Matching Service (CaRMS) applications.

Consequences of an Unsatisfactory Performance

Students should refer to the Student Evaluation Committee's (SEC) Policy for Development and Maintenance of Student Evaluations for consequences of unsatisfactory performance in any given year of the MD Program. This policy is located online as follows:

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference.

Student File

The Office of Medical Education maintains a file for each student in the MD Program one academic file and one non-academic file. The file is a combination of Years 1 and 2 (Pre-clerkship) and Year 3 (Clerkship) academic documentation.

For further information regarding a student's file, please refer to the online policy:

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference.

Promotions

On behalf of the Faculty Council, Student Academic Review Committee (SARC) determines whether or not students should be promoted to the next stage of the MD program, and ultimately receive the MD degree.

In accordance with The Terms of Reference for the Student Academic Review Committee, SARC is a delegated body of Faculty Council responsible for the review and ratification of undergraduate medical student performance. SARC makes recommendations to Faculty Council and the Dean concerning the promotion of students and discipline related to the academic performance (knowledge, skills and professional attitudes) of students who, by reason of unsatisfactory performance, cannot be promoted.

The Terms of Reference of the Student Academic Review Committee are located on the MD Programs website at: vp.ucalgary.ca/images/policies/aasarctormarch112015approvedbyfacultycouncilmarch112015ss. Students experiencing any academic difficulty should refer to this document and become fluent with the faculty rules regarding policies and procedure of promotion. Guidance regarding an appearance is available from Student Affairs, Faculty Advisors and the UME office.

Final decision for graduation is made by Faculty Council, under the advisement of SARC.

5.8 Appeals

Appeal Process

Students may appeal any evaluation decision within the MD Program. Students should be familiar with I. Reappraisal of Grades and Academic Appeals in the Academic Regulations Section of the Calendar as well as the MD Program's Policy for Reappraisal and Appeals of Student Evaluations posted online at:

ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference.

Appeals – Faculty Appeals Committee

Procedures for appealing a final grade reappraisal beyond the departmental level are detailed in I.2.1 Non-Disciplinary Appeals – Faculty Appeals Committee and are the same for a final grade as for a piece of graded term work.

6. Postgraduate (Residency Programs)

6.1 Course Registration

The Postgraduate Medical Education Office will register all new and ongoing students in residency programs with the Registrar's Office. Payment of fees is the responsibility of the student. Information is available through the Online Student Portal via MyUofC web portal. No specific course registration is required for postgraduate medical education except in the following circumstances:

Individuals registered in the Public Health Preventive Medicine (PHPM) Residency Program may register in a maximum of 8 graduate credit courses at no additional charge. These comprise three mandatory courses and five courses selected based on future career plans. For applicable courses please see 6.2 Academic Requirements.

All other individuals registered in postgraduate (residency) training who wish to complete graduate courses must register and pay applicable tuition fees.

Any individual pursuing postgraduate (residency) training that wishes to register for a Master's or PhD degree must register with the Faculty of Graduate Studies and pay the applicable tuition fees.

6.2 Academic Requirements

Students must complete a total of eight courses; all three from the Mandatory Courses list and select five from the Option Courses list.

Mandatory Courses

All of the following:

- Community Health Sciences 600: Introduction to Community Health Sciences
- Community Health Sciences 610: Biostatistics I: Essentials of Biostatistics
- Community Health Sciences 640: Fundamentals of Epidemiology

Option Courses

Select five from the following lists. The residency program encourages but does not restrict residents to choosing courses within a single academic stream. The selection is based on discussion regarding career path interest(s).

Biostatistics Stream

- Community Health Sciences 601: Determinants of Health
- Community Health Sciences 611: Biostatistics II: Models for Health Outcomes
- Community Health Sciences 664: Administrative Data Analysis Methodology

- Community Health Sciences 681: Health Research Methods

Community Rehabilitation and Disability Studies (CRDS) Stream

- Community Rehabilitation 676: Consultation in Human Services and Systems

Epidemiology Stream

- Community Health Sciences 643: Research in Healthcare Epidemiology and Infection Control
- Community Health Sciences 647: Clinical Epidemiology
- Community Health Sciences 649: Epidemiology of Infectious Diseases
- Community Health Sciences 740: Advanced Epidemiology
- Community Health Sciences 741: Systematic Reviews and Meta-analysis

Health Economics Stream

- Community Health Sciences 661: Health Economics I
- Community Health Sciences 662: Economic Evaluation
- Community Health Sciences 663: Decision Analysis in Health Economic

Health Services Research Stream

- Community Health Sciences 660: Foundations of Health Services Research

Medical Education Stream

- Community Health Sciences 621: Research Design and Statistics in Medical Education
- Community Health Sciences 623: Teaching Methods in the Medical Sciences
- Community Health Sciences 625: Curriculum Design and Evaluation in the Medical Sciences
- Community Health Sciences 627: Medical Education Measurement

Population and Public Health Stream

- Community Health Sciences 680: Foundations of Population/Public Health

Non-Stream

- Community Health Sciences 622: Qualitative Research in Medical Education
- Community Health Sciences 624: Medical Education Cognition Principles
- Community Health Sciences 644: Surveillance I: Data Handling for Infection Control
- Community Health Sciences 645: Surveillance II: Principles of Surveillance
- Community Health Sciences 646: Introduction to Public Health Surveillance
- Community Health Sciences 648: Online Basic Infection Control
- Community Health Sciences 665: Leadership in Health Care Organizations
- Community Health Sciences 666: Health Policy
- Community Health Sciences 667: Introduction to the Legal and Ethical Framework of Health Care in Canada
- Community Health Sciences 683: Qualitative Health Research
- Community Health Sciences 687: Environmental Health

7. Administration

Faculty Administrative Officers

Dean

J.B. Meddings

Vice Dean

G.M. MacQueen

Senior Associate Deans

J. Lockyer, Education

R.J. Bridges, Faculty Affairs

M. Tonelli, Health Research

G.W. Zamponi, Research

Associate Deans

S. Wiebe, Clinical Research

D. Exner, Clinical Trials

L.J. Cooke, Continuing Medical Education & Professional Development

D.L. Myhre, Distributed Learning & Rural Initiatives

J. De Groot, Equity & Professionalism

D. Keegan, Faculty Development

T.L. Beattie, Graduate Sciences Education

M.H. Topps, Post Graduate Medical Education

R.W. Turner, Research Grants

P. Schnetkamp, Research Infrastructure

J.M. Hatfield, Strategic Partnerships & Community Engagement

E.U. Kurz, Undergraduate Health and Science Education

S. Coderre, Undergraduate Medical Education

Assistant Deans

P. Sargious, Continuing Medical Education & Professional Development: Educational Development & Innovation

H.A. Armson, Continuing Medical Education & Professional Development: Family Physician Education

G.L. Hollaar, Global Health & International Partnerships

P. Chu, Post Graduate Medical Education

K. Millar, Post Graduate Medical Education, Education & Assessment Initiatives

P.M. Veale, Undergraduate Medical Education, Clerkship

K.D. Busche, Undergraduate Medical Education, Pre-Clerkship

K.J. McLaughlin, Undergraduate Medical Education, Research & Innovation

Executive Directors

E. Woolner, Alumni Affairs

G. Levy, Executive Director & Chief Financial Officer

Managers

K. Potter, Academic Appointments

P. Romeo, Educational Operations

For more information, please visit the Cumming School of Medicine website at cumming.ucalgary.ca/.

Faculty of Environmental Design

1. Summary of Degree Programs

Degrees Offered

Architecture	Environmental Design	Planning	Environmental Design	Landscape Architecture
MArch	MEDes	MPlan	PhD	MLA

Graduate

At the master's level, the Faculty of Environmental Design offers a course-based Master of Architecture, a course-based Master of Landscape Architecture, a course-based Master of Planning, and a thesis-based Master of Environmental Design.

The Master of Architecture is a course-based first professional degree at the graduate level. The degree is accredited by the Canadian Architectural Certification Board. The Master of Planning is a course-based first professional degree at the graduate level. The degree is accredited by the Professional Standards Board of the Canadian Institute of Planners. The thesis-based Master of Environmental Design is a research degree that involves independent inquiry into a range of contemporary issues of human intervention in environments across the spectrum of faculty research expertise.

The Master of Landscape Architecture is a course-based first professional degree at the graduate level, whose curriculum reflects the requirements for accreditation by the Canadian Society of Landscape Architects (we will be seeking accreditation with the graduation of our first cohort in 2018).

The PhD degree in Environmental Design involves interdisciplinary research inquiry in thematic areas related to Architecture, Planning, and Sustainable Design across the spectrum of faculty research expertise.

Note: More information on these programs can be obtained from the Faculty of Graduate Studies calendar.

Undergraduate

The Faculty of Environmental Design offers a Minor in Architectural Studies at the undergraduate level.

2. Faculty Information

Contact Information

Location:

Professional Faculties 2182

Student Information:

403.220.6601

Fax number:

403.284.4399

Email address:

evdsinfo@ucalgary.ca

Website:

evds.ucalgary.ca

Introduction

The Faculty of Environmental Design has a dual mandate to offer course-based, first professional degrees in Architecture, Landscape Architecture and Planning, and to offer advanced research opportunities in the Master of Environmental Design and PhD thesis degree programs. The latter research focus is intended for candidates who wish to build upon their professional career experience or related degree, with advanced, problem oriented research.

It is worth noting that since the Faculty's founding in 1971, the important roles for design, planning and management in human activities which impact built and natural environments have increased substantially. Significantly, the Faculty has championed interdisciplinarity as a means to understand and address the complex, and often subtle, interrelationships evident in the pursuit of these human activities. Further, the Faculty actively seeks to work co-operatively with local communities, governments, private corporations, associations and experts in other University Faculties to address complexity in a myriad of environmental design problems. The resulting outcomes may include new buildings, communities, artifacts, urban forms, and cultural landscapes, as well as plans, policies, environmental and ecosystem management strategies, and new technologies and information systems.

Enquiries

For programs and admission information, please refer to the Faculty of Environmental Design website (evds.ucalgary.ca) or contact evdsinfo@ucalgary.ca.

Telephone and mail enquiries may be directed to:

Programs Administrator

Faculty of Environmental Design

University of Calgary

Calgary, Alberta, Canada

T2N 1N4

Telephone: 403.220.4388

Pattern

Master's degrees are offered by the Faculty of Environmental Design. Please refer to the Faculty of Environmental Design website for further details.

For PhD studies, an area of specialization, submitted by the student and supervisor, must receive the approval of the PhD Program Director prior to its submission to the Faculty of Graduate Studies for their approval.

The Faculty offers a Minor Field of Specialization in Architectural Studies at the undergraduate level.

A recognized four year undergraduate university degree is required for admission to the Master of Architecture, Master of Planning and the Master of Environmental Design pursuant to Faculty of Graduate Studies regulations. Senior undergraduates in other Faculties may be eligible to take courses in the Faculty of Environmental Design. However, prior approvals of the instructor and the Faculty are required.

3. Faculty Regulations

3.1 Admissions

Admission to graduate degree programs in the Faculty follows Faculty of Graduate Studies regulations and requirements and Degree Program admission requirements identified below. Current Graduate Studies and Faculty admission requirements are available on the University website.

Applicants to the master's degree programs will require a four-year baccalaureate degree from a recognized university with a grade point average (GPA) in the final two years of study of at least 3.00 (based on a four-point grading system). The Faculty of Graduate Studies may approve special admission requests.

Consistent with Faculty of Graduate Studies requirements, prior to admission to the Faculty of Environmental Design, all applicants must demonstrate English language proficiency for purposes of admission. Please refer to the Faculty of Graduate Studies website (grad.ucalgary.ca) for current special admission request and English language proficiency requirements. For applicants who are required to prove proficiency in English, a TOEFL score of 600 (paper-based); or 100 (Internet-based test); or an IELTS score of 7.5.

Admission to the Minor in Architectural Studies follows Program admission requirements identified below.

Because of limitations on enrolment, all applicants meeting admission requirements are not necessarily admitted.

Master of Architecture (MArch)

Admission to the professional Architecture Program is a competitive process. Applicants must meet minimum Faculty of Graduate Studies requirements (including a 3.00 GPA and English proficiency) and the Architecture Program admission requirements (see the Faculty of Graduate Studies Calendar and additional information is also available on the Faculty of Environmental Design website). For admission to the two year MArch degree program, applicants

must demonstrate successful completion of prerequisite requirements in four areas: Design, Technology, Communications, and History/Theory. Without these prerequisites, students apply for the MArch Foundation Year, which must be successfully completed before advancing to the two-year MArch. Therefore, admission to the MArch may be achieved in one of the following three ways:

- Admission into the MArch Degree based on the completion of a recognized four year undergraduate degree with a minimum 3.00 GPA calculated on the final two years but needing to complete one or more of the ten course prerequisites required for admission. A student with these qualifications would enter the MArch Foundation Year and complete its studies prior to taking the regular two year curriculum in the MArch; or
- Admission into the MArch Degree based on the completion of a four year undergraduate degree from the University of Calgary with a Minor in Architectural Studies (ARST) and a minimum 3.00 GPA calculated on the final two years; or
- Admission into the MArch Degree based on the completion of a recognized four year undergraduate pre-professional or professional architecture degree (or equivalent) program with a minimum 3.00 GPA calculated on the final two years.

Candidates for the MArch Program (including those entering into the Foundation Year of the Program) must submit a digital portfolio (along with the other application requirements). The portfolio must provide evidence of original and/or creative work in any field or medium, and provide in writing a brief description of the work. The requirements for digital portfolio submissions can be found on the Environmental Studies website: evds.ucalgary.ca/content/master-architecture-march-admissions. Candidates are also required to submit a clearly-written statement of intent and three reference letters.

Students seeking advanced credit for courses should refer to the Faculty of Graduate Studies Calendar.

Master of Environmental Design (MEDes)

Requirements for applications to the Master of Environmental Design include:

a) A clear, concise and substantive statement of interest (1,000 to 1,500 words), which informs the Admissions Committee of:

- The applicant's reasons for pursuing the MEDes degree
- How the applicant's specific educational background and professional and personal experience relates to their proposed thesis project
- The applicant's thesis research interests and ideas to clarify the applicant's supervisory needs

b) At least one example of the applicant's previous academic or professional work such as an essay, published research paper, major academic paper, thesis, design project, or consulting report.

In addition, applicants may submit a portfolio that provides examples of or illustrates the applicant's design work, professional work, research, creative thinking, community action, planning products, or graphics and visual communication.

If any of the work submitted involved collaboration with others, applicants must clearly identify what aspects of the work are their own. The examples of work and (if applicable) portfolio should be submitted in digital form (portable document (PDF) files), uploaded by the applicant to their Student Centre, upon submission of their online application.

c) A funding plan that demonstrates financial resources are available for the entire program of study.

d) Three reference letters.

Master of Landscape Architecture (MLA)

Applicants to the MLA program must possess a four-year baccalaureate degree with a grade point average (GPA) in the final two years of study of at least 3.00 (based on a four-point grading system). Also required in the application is a statement of intent, examples of work in the form of a portfolio that illustrates creative ability and potential, three appropriate letters of reference, and proof of English proficiency (if required). The deadline for applications is January 15.

Requirements for admission to graduate programs at the University of Calgary are available via the Faculty of Graduate Studies calendar at the following website: ucalgary.ca/pubs/calendar/grad/current/gs-a.

Specific information on admission to a Graduate Program in the Faculty of Environmental Design is available on the EVDS website: evds.ucalgary.ca/content/admissions-faculty-environmental-design.

Starting in 2016, there will be two potential entry points into the program: entry for students with non-design undergraduate degrees into the foundation year and then the two professional Master's years; and for students with pre-professional design degrees from other institutions in Canada or abroad, entry directly into the M1 year and completion of the two professional Master's years.

Master of Planning (MPlan)

Admission to the Master of Planning is a competitive process. Applicants must meet minimum Faculty of Graduate Studies requirements (including a 3.00 GPA and English proficiency) and the Planning Program admission requirements (see the Faculty of Graduate Studies Calendar and additional information is also available on the Faculty of Environmental Design website). In addition to Faculty of Graduate Studies requirements, the Faculty of Environmental Design requires:

a) A clear, well-written, statement of intent which describes the applicant's interest in planning and how the applicant's specific educational background and professional or personal experience relates to Planning as a field of study.

b) At least one example of the applicant's previous academic or professional writing, such as a written essay, published research paper, major academic paper, design project or consulting report.

A portfolio may also be submitted that includes examples of the applicant's design work or design thinking, creative work or ideas, community action, planning or design products, or graphics and visual communication.

The requirements for digital portfolio submissions are found in the Faculty of Environmental Design website at: evds.ucalgary.ca/content/master-planning-mplan-admissions.

The portfolio should be submitted in digital form (portable document (PDF) files), uploaded by the applicant to their Student Centre upon submission of their online application.

c) Three reference letters.

Minor Field of Specialization in Architectural Studies

In order to be eligible for the Minor, students must have successfully completed a minimum of 24 units (4.0 full-course equivalents) in post-secondary study by the end of the Fall Term in the year in which they apply. Admission to the Minor will be granted for the Fall Term only. Students must apply via their online Student Centre by February 1.

The Minor has a fixed number of places for students. Students will be admitted on a competitive basis. The application to the Minor will include consideration of the applicant's grade point average and a portfolio of their creative work.

A minimum grade point average of 3.20 is required for consideration for admission, but does not guarantee admission. The grade point average for admission purposes will be calculated over the most-recent course work to a maximum of 30 units (5.0 full-course equivalents) inclusive of the University of Calgary courses and/or transferable courses taken at other institutions.

Applicants to the Minor must submit a digital portfolio that provides evidence of original or creative work in any field or medium, and includes a brief statement of their interest in the Minor. The requirements for digital portfolio submissions can be found on the Environmental Design website: evds.ucalgary.ca/content/minor-architectural-studies-arst.

Application Procedures

The deadline date for applications to the Master of Architecture, Master of Planning and Master of Environmental Design programs is January 15, for admission to the following Fall Term. The deadline date for applications to the Minor Field of Specialization in Architectural Studies is February 1, for admission to the following Fall Term. Degree Program Admission Committees for the Master of Architecture, Master of Planning and Master of Environmental Design and the Minor of Architectural Studies evaluate

the respective pool of eligible candidates and offers admission to the most-qualified applicants. New admissions to all programs may be limited in number as required on an annual basis.

3.2 Accuracy of Registration

Students are responsible for the completeness and accuracy of their registration and for arranging their program to meet all requirements as detailed in this Calendar. Students should, however, seek advice from the Faculty of Environmental Design concerning their choice of courses. In cases of doubt about the interpretation of regulations, a student should consult the Graduate Program Administrator or the Associate Dean for their Program.

4. Program Descriptions

Master of Architecture (MArch)

The professional Architecture program offers a three year curriculum, based on a two year MArch program, plus a Foundation Year when appropriate, leading to the professional Master of Architecture degree accredited by the Canadian Architectural Certification Board (CACB) that prepares students for practice as a registered architect in North America. After its last review in 2011, the University of Calgary Master of Architecture professional program in architecture was accredited for another six years by the Canadian Architectural Certification Board (CACB). This is the maximum period for which programs can be accredited between reviews. Under the North American Free Trade Act, this means that accredited Canadian degrees are fully recognized in the United States and vice versa. In Canada, all provincial associations recommend a degree from an accredited professional degree program as a prerequisite for licensure. The Canadian Architectural Certification Board (CACB), which is the sole agency authorized to accredit Canadian professional degree programs in architecture, recognizes two types of accredited degrees, the Bachelor of Architecture and Master of Architecture. A program may be granted a six-year, three-year, or two-year term of accreditation, depending on the degree of conformance with established educational standards. Master's degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

The MArch degree provides a foundation for a range of career opportunities in design, construction and management of the built environment as well as a basis for subsequent advanced design and scholarly research. The MArch curriculum offers an integrated base for developing skills and knowledge in design, communication, technology, history, and theory, cultivated within the program's teaching and research expertise in sustainable design, digital design and fabrication, architecture and the contemporary city, critical practice, and architectural history and theory. In the interdisciplinary design milieu of the Faculty of Environmental Design, architecture students explore innovation and creativity side-by-side with students interested in a wide variety of environmental design disciplines focused on a comprehensive understanding of the built and natural environments.

Architectural design studios provide structured opportunities for advanced design studies and projects in both an individual and collaborative context. Enrichment opportunities include a public lecture series, distinguished international guests delivering seminar and design charrette experiences, publications, and the award-winning Barcelona and Melbourne Studies Abroad (where students are immersed in a foreign design culture for one term).

Master of Environmental Design (MEDes)

The Master of Environmental Design is an interdisciplinary degree concerned with designing, planning, managing, and studying human activities in the built and natural environments. The degree is thesis-based and driven by the student's Program of Study, developed in conjunction with their supervisor. For students with an appropriate professional background, the degree provides the opportunity to pursue research in a specific area of interest. Therefore, a clear statement of design or research interest in one of the areas of faculty research expertise is of particular importance in the admissions process. Students are admitted from a variety of backgrounds, but normally are in possession of professional design or planning degrees, post-professional design degrees, or significant work experience in a related field.

Master of Landscape Architecture (MLA)

The Master of Landscape Architecture is a three-year (a foundation year plus two years at the Master's level) graduate professional program. It engages with the critical sociocultural and ecological challenges of placemaking, climate change, and resilience, through the process of design. Our faculty's strengths in urban design, ecological design, regional planning, and cultural landscapes give our program its focus, and we are heavily engaged in our local and regional communities through field studies and real-world projects that we take on in our studio and theory courses. Students learn about the professional practice of landscape architecture through courses in history/theory, technology, and urban and green infrastructure, as well as 2D and 3D graphics and modeling as tools for understanding and communicating. Students from a variety of backgrounds are welcome, with environmental design, geography/urban studies, natural sciences and fine art providing good entry points. As a new program, we will be seeking accreditation from the Canadian Society of Landscape Architects with the graduation of our first cohort in 2018.

Master of Planning (MPlan)

The Master of Planning is a two-year, course-based program which is accredited by the Professional Standards Board of the Canadian Institute of Planners. The emphasis in the program is on sustainability, interdisciplinarity, physical planning and urban design. The Master of Planning degree prepares students for practice as urban, regional, community, and environmental planners in public, private and non-profit agencies, firms, and institutions in Canada and abroad. The program is studio-based with a sequence of thematic studios, required courses, selective courses, and technology courses that provide students with current and relevant skills and knowledge and understanding of planning issues.

Doctor of Philosophy (PhD)

The Doctor of Philosophy is an interdisciplinary degree concerned with designing, planning, managing, and studying human activities in the built and natural environments. The degree is thesis-based and driven by the student's Program of Study, developed in conjunction with their supervisor. For students with an appropriate professional background, the degree provides the opportunity to pursue research in a specific area of interest. Therefore, a clear statement of design or research interest in one of the areas of faculty research expertise is of particular importance in the admissions process. Students are admitted from a variety of backgrounds, but normally are in possession of professional design or planning degrees, post-professional design degrees, or significant work experience in a related field.

Minor Field of Specialization in Architectural Studies

The courses required for the Minor are equivalent to the courses in the MArch Foundation Year, and constitute the prerequisites for the University of Calgary's two-year MArch degree. Completion of this Minor does not guarantee admission to the MArch or to other degree programs in the Faculty of Environmental Design, but it may reduce the number of courses that are required for an MArch. Students completing the Minor must apply for admission to the MArch degree.

Students interested in pursuing an MArch at the University of Calgary should note that only those students who have completed a four-year degree are considered for admission. A three-year Bachelor of Communication and Culture coupled with the Minor is not sufficient.

Field of Architectural Studies

The Field of Architectural Studies consists of the following courses:

Architectural Studies 423, 444, 449, 451, 453, 457.01, 457.02, 483, 484.

Requirements

The following 30 units (5.0 full-course equivalents) must be completed successfully to achieve the Minor:

- Architectural Studies 423 Sustainability in the Built Environment
- Architectural Studies 444 Studio II in Architecture
- Architectural Studies 449 Building Science and Technology I
- Architectural Studies 451 Graphics Workshop I
- Architectural Studies 453 Graphics Workshop II
- Architectural Studies 457.01 History of Architecture and Human Settlements I
- Architectural Studies 457.02 History of Architecture and Human Settlements II
- Architectural Studies 484 Studio I - Design Thinking

Recommendations

The following optional elective courses in Environmental Design are also available to students in the Minor:

- Environmental Design Block 697.33 Field Trip
- Architectural Studies 483 Interdisciplinary Seminar
- Other electives with approval of the Associate Dean (Academic – Architecture)

Other undergraduate courses in Environmental Design available to all students include:

- Architectural Studies 201 Introduction or Architectural Studies
- University 207 Exploring Sustainability
- Environmental Design 401 Introduction to Environmental Design

5. Administration

Faculty Administrative Officers

Dean

N. Pollock-Ellwand

Associate Deans

G. Livesey, Academic - Architecture

B.A. Sandalack, Academic - Landscape Architecture and Planning

J.L.S. Brown, Research and International

Graduate Program Director (Thesis-Based)

D. Monteyne

For more information please visit the Faculty of Environmental Design website at: evds.ucalgary.ca.

Faculty of Graduate Studies

For more information, please consult the 2016/2017 Faculty of Graduate Studies Calendar at ucalgary.ca/calendar, or visit the Faculty of Graduate Studies website at: grad.ucalgary.ca/.

1. Degrees Offered

Please see Degree Chart below.

Graduate Programs

The Faculty of Graduate Studies administers doctoral programs leading to a Doctor of Philosophy or Education, and master's programs leading to a Master of Architecture, Master of Arts, Master of Biomedical Technology, Master of Business Administration, Master of Communications Studies, Master of Community Medicine, Master of Counselling, Master of Disability and Community Studies, Master of Education, Master of Engineering, Master of Environmental Design, Master of Fine Arts, Master of Geographic Information Systems, Master of Kinesiology, Master of Landscape Architecture, Master of Laws, Master of Music, Master of Nursing, Master of Pathologists' Assistant, Master of Public Policy, Master of Planning, Master of Science, Master of Social Work, or Master of Strategic Studies.

Combined Degree Programs

The Faculty of Graduate Studies has approved guidelines for Combined Degree Programs. A Combined Degree Program is a formal arrangement between two units offering programs whereby students may be registered simultaneously in two graduate programs (or in one master's program and one professional program such as JD or MD that normally admits students with undergraduate degrees). The University of Calgary presently offers the following combined degree programs: JD/MBA, JD/MPP, MBA/MPP, MBT/MBA, MSW/MBA, MD/Master's, and MD/PhD (Leaders in Medicine). Information is available from the relevant graduate programs.

2. Faculty Information

Enquiries concerning graduate programs should be directed to the unit offering the program. The Faculty of Graduate Studies website contains direct links to units offering graduate programs: grad.ucalgary.ca.

Introduction

The mission of the Faculty of Graduate Studies at the University of Calgary is to work with graduate programs to aid them in attracting well-prepared students, supporting the students well while they are here, graduating a high percentage of them in reasonable time, and producing graduate degree holders who are well-respected contributors in their fields wherever they are employed. To achieve this, the Faculty works with programs in setting admission standards and program requirements, and in establishing supervisory and examination committees. The Faculty is also closely involved in the administration of over $30 million annually in financial awards for graduate study.

3. Admissions

There is no general right of admission to Graduate Programs. Each program determines whether to recommend to the Faculty of Graduate Studies the admission of a particular applicant based not only on the applicant's credentials but also on the availability of resources for supervision and research, departmental research objectives, program balance, and other such considerations. Taking these considerations into account, graduate programs are expected to act in equitable manner in their admission procedures.

Graduate students are admitted to the Faculty in one of the following categories:

ANTH	ARKY	ART	BISI	BMEN	CHEM	CMMS	CMD	CMSS	CPSY	CPSC	DRAM	ECON	EDER
PhD	PhD	MFA	PhD	PhD	PhD	PhD	PhD	PhD	PhD	PhD	MFA	PhD	PhD
MA	MA		MSc	MSc	MSc	MA	MSc	MSS	MSc	MSc		MA	EdD
				MEng		MCS							MA
													MSc
													MEd
EDPS	**ENCH**	**ENCI**	**ENEL**	**ENGO**	**ENME**	**ENGL**	**EVDS**	**FISL**	**GEOG**	**GLGP**	**GRST**	**GSEA**	**HIST**
PhD	PhD	PhD	PhD	PhD	PhD	PhD	PhD	MA	PhD	PhD	PhD	MA	PhD
MSc	MSc	MSc	MSc	MSc	MSc	MA	MArch		MA	MSc	MA		MA
MC	MEng	MEng	MEng	MEng	MEng		MEDes		MSc				
MEd							MPlan		MGIS				
							MLA						
KNES	**IGP**	**LAW**	**LING**	**MDBC**	**MDBT**	**MDCV**	**MDCH**	**MDGI**	**MDIM**	**MDMI**	**MDNS**	**MDSC**	**MGMT**
PhD	PhD	LLM	PhD	PhD	MBT	PhD	PhD	PhD	PhD	PhD	PhD	PhD	PhD
MSc	MA	JD/MBA	MA	MSc	MBT/MBA	MSc	MSc	MSc	MSc	MSc	MSc	MSc	MBA
MKin	MSc	JD/MPP					MDCS					MPath	JD/MBA
													MBT/MBA
													MSW/MBA
													MPP/MBA
MTST	**MUSI**	**NURS**	**PHIL**	**PHAS**	**POLI**	**PSYC**	**PPOL**	**RELS**	**SEDV**	**SOCI**	**SOWK**	**VMS**	
PhD	PhD	PhD	PhD	PhD	PhD	PhD	MPP	PhD	MSc	PhD	PhD	PhD	
MSc	MA	MN/NP	MA	MSc	MA	MSc	JD/MPP	MA		MA	MSW/MBA	MSc	
	MMus	PMNP					MBA/MPP				MSW		
		MN											

Regular

Students may be admitted to a program leading to the master's or doctoral degree, provided admission qualifications are met.

Interdisciplinary Degree: A student wishing to pursue a thesis-based master's or doctoral degree in an area not sufficiently represented by one graduate program can request to do an interdisciplinary degree. In an interdisciplinary degree program, the student is admitted to both a home program and a conjoint program. The student submits an application form and fee along with official transcripts and letters for reference to the proposed home program, which will liaise with the proposed conjoint program.

Special Case Admission may be used when resources are available to admit a student to undertake graduate studies, but no appropriate program exists. Contact the relevant department for details.

Qualifying

A student who meets the qualifications for admission but lacks the necessary background for a graduate program in a chosen area of specialization may be admitted as a qualifying graduate student. Upon satisfactory completion of a qualifying year, the student may be transferred to regular student status. Qualifying graduate students must be full-time registrants in either a master's or a doctoral degree program. Qualifying status will not be granted for a period exceeding one year.

Because a qualifying student is required to take more courses in a degree program than a regular graduate student, a qualifying student in a thesis-based degree program will be assessed an extra year of full program fees. A qualifying student in a course-based program will pay tuition fees for the extra required courses on a per-course basis. Tuition fees for courses taken during the qualifying year will not count toward the tuition fee for the degree program.

Visiting

A student who is registered in a graduate degree program at another university that does not have an exchange agreement with the University of Calgary, and who wishes to engage in course work and/or research at the graduate level at the University of Calgary for credit at their home university may be admitted as a visiting graduate student. A visiting student must submit a completed *Visiting Student Application* form and the application fee. Visiting students apply to specific graduate programs, and the applications are forwarded to the Faculty of Graduate Studies for registration. Visiting students pay all applicable general and tuition fees. Visiting students are normally permitted to spend a maximum of one year at the University of Calgary. It should be noted that admission as a visiting student does not guarantee later admission to a graduate program at the University of Calgary.

Exchange

The Faculty of Graduate Studies at the University of Calgary has reciprocal exchange agreements with other institutions. Graduate students from these institutions may engage in course or research work at the University of Calgary for credit at the home institution. Exchange students must submit the appropriate application/approval form (grad.ucalgary.ca/prospective/students-from-other-universities). Exchange students pay tuition fees at the home universities when this is written into the specific exchange agreement; they pay only the applicable general fees at the University of Calgary. If there is no reciprocal agreement, the exchange student pays both applicable general and tuition fees at the University of Calgary. It should be noted that exchange student status does not guarantee later admission to a graduate program at the University of Calgary.

The Western Deans' Agreement covers graduate students from member universities in British Columbia (British Columbia Institute of Technology, Royal Roads University, Simon Fraser University, University of British Columbia, University of Northern British Columbia, Thompson Rivers University and University of Victoria), Alberta (Athabasca University, Concordia University College of Alberta, University of Alberta, University of Calgary, University of Lethbridge), Saskatchewan (University of Regina, University of Saskatchewan), and Manitoba (Brandon University, University of Manitoba).

The Canadian Graduate Student Mobility Agreement, initiated by the Canadian Association for Graduate Studies (CAGS), encourages graduate student mobility within Canada in order to foster the exchange of ideas, specialized training, research collaboration, and interdisciplinarity. Graduate students, who must be registered full-time and paying fees at a participating home university, may register as "visiting graduate research students" at another participating university. No tuition fees will be charged to visiting graduate research students, provided they are not taking courses at the host institution. Incidental fees may be charged.

4. Qualifications

Applicants must hold or obtain the following minimum qualifications before the Faculty will give consideration to admission:

(a) A four-year baccalaureate degree or its equivalent from a recognized institution. Degrees and grades from other institutions are evaluated for their equivalency to those of the University of Calgary. A grade point average equivalent to 3.00 or better (on the University of Calgary four-point system) is required. This is based on the last two years of the undergraduate degree consisting of a minimum of 10 full-course equivalents. Senior Level courses of appropriate content for the graduate program applied for and any graduate work may also be considered. Individual graduate programs may require a higher admission grade point average.

In most cases, a master's degree or equivalent is required for admission to a doctoral program. See program listings in the Graduate Calendar (grad.ucalgary.ca/calendar) for exceptions and details.

(b) Proficiency in the English language is essential for the pursuit and successful completion of graduate programs at the University of Calgary. It is the student's responsibility to demonstrate proficiency in English.

5. Administration

Faculty Administrative Officers

Dean

L. Young

Associate Deans

J. Azaiez

L. Hughes

G. Shimizu

R. Yates

Assistant Dean

D. Hansen

Senior Director Strategic Operations

G. Robinson

For more information please consult the 2016/2017 Faculty of Graduate Studies Calendar at http://grad.ucalgary.ca/calendar, or visit the Faculty of Graduate Studies website at: http://www.grad.ucalgary.ca.

Haskayne School of Business

1. Summary of Degree Programs

Degrees Offered

Undergraduate	
Commerce	Hotel & Resort Management
BComm	BHRM*
BComm Co-op	
BComm/BA or BSC[1]	
BComm/BKin[2]	
BComm/BSc[3]	

The Bachelor of Hotel and Resort Management (BHRM) is currently suspended. No new admissions will be permitted.
[1]Combined Degree with the Faculty of Arts
[2]Combined Degree with the Faculty of Kinesiology
[3]Combined Degree with the Faculty of Science

Graduate
MBA
JD/MBA[1]
MPP/MBA[2]
MD/MBA[3]
MSW/MBA[4]
MBT/MBA[5]
PhD

[1]Combined Degree with the Faculty of Law
[2]Combined Degree with the School of Public Policy
[3]Combined Degree with the Cumming School of Medicine
[4]Combined Degree with the Faculty of Social Work
[5]Combined Degree with the Cumming School of Medicine

Undergraduate

The Haskayne School of Business offers programs leading to Bachelor of Commerce (BComm) and Bachelor of Hotel and Resort Management (BHRM) degrees.

Combined Programs

Additionally, the Haskayne School of Business offers combined degree programs with the Faculty of Science, a Combined Bachelor of Commerce/Bachelor of Science (Actuarial Science) or (Computer Science); with the Faculty of Kinesiology, a Combined Bachelor of Commerce/Bachelor of Kinesiology (details in 4.3 Combined Degrees).

The Combined Bachelor of Commerce/Bachelor of Arts or Bachelor of Science (depending on the major), with the Faculty of Arts is available in: Ancient and Medieval History, Anthropology, Archaeology, Communication and Media Studies, Development Studies, East Asian Studies, East Asian Language Studies, Economics, English, Film Studies, French, Geography, German, Greek and Roman Studies, History, History and Philosophy of Science, International Indigenous Studies, International Relations, Italian Studies, Latin American Studies, Law and Society, Linguistics, Linguistics and Language, Music, Philosophy, Political Science, Psychology, Religious Studies, Religious Studies and Applied Ethics, Russian, Sociology, Spanish, Urban Studies and Women's Studies.

Co-operative Education

Co-operative Education is an academic program designed to achieve the educational and career goals of many BComm students. Participants take their classroom learning to the job and bring their working knowledge back to the classroom. The experience gives students first hand knowledge of what business is all about prior to graduation.

Minor

The Haskayne School of Business offers a minor program in Management and Society for students registered in other faculties.

Graduate

The Haskayne School of Business offers programs leading to Master of Business Administration (MBA) and PhD degrees. Details regarding the MBA and PhD degrees may be found in the Faculty of Graduate Studies Calendar.

Diplomas or Certificates

In conjunction with the Schulich School of Engineering, the business school also offers a diploma program in Project Management (details of this program are given in the Schulich School of Engineering section of this Calendar).

2. Business School Information

Contact Information

Location: Scurfield Hall 351

Student Information: 403.220.6593

Phone number: 403.220.5685

Email address:
undergraduate@haskayne.ucalgary.ca

Website: haskayne.ucalgary.ca/

Introduction

The challenge of competing effectively in a rapidly changing global economy can only be met through well-educated responsive business leadership.

Preparing those who will successfully meet this challenge is the Haskayne School of Business's mission, accomplished through its mandate of teaching, research and community service. Recognizing that the practices of commerce, business and management are fundamental to, and impact upon every facet of contemporary society, delivery of comprehensive business education programs that are relevant and rigorous, yet responsive to change, forms the fundamental framework for the business school's broad range of academic and executive programs.

Pattern

The business school offers the undergraduate programs in traditional fashion in which students complete eight academic study terms or through the Co-operative Education program in which students complement their academic studies by interspersing three or four four-month paid work terms with their study terms. (Details regarding the Co-operative Education program appear in the Co-operative Education section of this Calendar.)

After admission to the Bachelor of Commerce program, a student will complete an integrative core curriculum of business education in the areas of strategy and global management, entrepreneurial thinking, accounting, finance, human resources and organizational dynamics, operations management, business technology management, and marketing. An advisory system will provide assistance in selecting an area of concentration. The curriculum allows pursuit of a degree program fulfilling the business school objective of a strong general educational background together with a broad, integrative commerce education permitting a limited amount of functional specialization.

Objectives

The component parts of the programs have been formulated on the principle that graduates will spend a major portion of their work life in a constantly changing environment. Therefore, the task of the business school is to provide the student with the opportunity to obtain a broad knowledge of the concepts underlying the operation and management of organizations. Upon graduation, a student should be equipped to function, not only in an initial position, but also for the whole of their subsequent career.

Opportunities

The Bachelor of Commerce program and Master of Business Administration program are accredited by The Association to Advance Collegiate Schools of Business.

Table of Contents

Bachelor of Commerce

The generalist orientation of this degree enables graduates to succeed in a range of diverse industries and positions. Organizations seek candidates who have developed relevant educational, extracurricular (clubs, volunteer positions), summer/part-time work experiences and take responsibility for the direction of their working lives.

The key to obtaining meaningful employment after graduation is the development of a marketable portfolio of skills and experiences. The Haskayne School of Business assists business students in:

- Researching career interests
- Skill identification
- Resume/cover letter targeting
- Interview preparation
- Identifying work opportunities

Bachelor of Hotel and Resort Management

The intent of the degree is to develop students with both a skills-based and management theory education, who have the potential to assume senior positions in the hospitality industry (specifically in the accommodation and food and beverage sectors).

It is anticipated that these students will appeal to businesses in the hospitality sector of the tourism industry.

MBA

The mission of the Haskayne MBA is to challenge students to develop their abilities as managers. The program develops skills in leadership, business development, communication, and strategic analysis through the core functions of business, and through focused specializations.

PhD

In addition to the role of an academic professor, students earning the PhD degree can succeed in research and advisory roles in government as well as a broad spectrum of industries and organizations.

Haskayne Student Organizations

Student-run organizations help to build community with fellow classmates, professors, alumni and businesses. Participating students apply theory to practice and develop interpersonal, leadership, task management, and creative thinking and problem-solving skills. A network of business contacts starts here.

The Commerce Undergraduate Society supports and co-ordinates student club affairs, and organizes major social, sports, networking and academic-related events in collaboration with campus and corporate communities (cuscalgary.ca).

The Haskayne Students' Association provides student governance and voice, works to resolve student issues and transparency, and develops initiatives to improve the student experience, engagement, and recognition of the school (hsaucalgary.com).

Resources

Computers in the Business School

All areas in business make extensive use of computers. Therefore, the business school recommends that students entering the business school purchase an appropriate computer for use in their academic program. Information on the recommended hardware and software configuration is available from the business school website haskayne.ucalgary.ca/services/its/students.

3. Business School Regulations

3.1 Admissions

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for general regulations regarding admission requirements to the University of Calgary.

The Haskayne School of Business has quotas on the number of students accepted into the Bachelor of Commerce or Bachelor of Hotel and Resort Management programs. Within these quotas, there is a further quota on the number of students accepted into the Tourism Management, Petroleum Land Management and Energy Management Concentrations. Admission into the Energy Management and Tourism Management Concentrations will be competitive based on academic performance. Admission into the Petroleum Land Management Concentration will be competitive based on academic performance, an interview and other required documents. Only those students entering third year of the Bachelor of Commerce program will be considered for admission into the Petroleum Land Management Concentration.

To be eligible for first year admission consideration, applicants must be coming directly from high school and/or presenting no more than six units (1.0 full-course equivalent) transferable courses from a post-secondary institution (including the University of Calgary). Applicants presenting more than six units (1.0 full-course equivalent) transferable courses from a post-secondary institution (including the University of Calgary), will be considered for admission following the successful completion of a prescribed set of pre-commerce requirements. Additional information is provided in 4.1.1 BComm Requirements for Direct Entry Students and in 4.1.2 BComm Pre-Commerce Requirements for Transfer Students.

Students seeking re-admission into the Haskayne School of Business following a voluntary withdrawal will be considered in competition with new transfer applicants and required to meet the transfer admission criteria prior to re-admission. Such students are encouraged to consult with the Haskayne Undergraduate Programs Office for advice and course planning.

Students seeking re-admission into the Haskayne School of Business after a requirement to withdraw are referred to "Student Probation and Dismissal" in 3.4 Student Standing.

Students who have obtained a Bachelor of Commerce, Bachelor of Administration, or equivalent degree may not enrol in a "second" Bachelor of Commerce degree.

Students who hold an approved non-business degree (BA, BSc, BEd, etc.), that is recognized by the University of Calgary are encouraged to speak to a graduate advisor regarding the admission requirements for the Master of Business Administration (MBA) program. Those who wish to pursue the Bachelor of Commerce as a second or subsequent undergraduate degree are advised that they will be required to follow the admission procedures and meet the requirements in place for transfer applicants to the program. For additional regulations regarding admission to a second undergraduate degree, refer to A.5.5 Second-Degree Students in the Undergraduate Admissions section of this Calendar.

Students not registering for the admission term must reapply for admission into the program.

Students are advised to register for courses as soon as they are eligible to ensure the best selection. Those admitted after registration begins are required to register within three weeks of the issuance of their notification of admission. The Haskayne School of Business reserves the right to rescind the offer of admission if course registration has not taken place within a three week period. The admission procedures are the responsibility of the Haskayne Undergraduate Programs Office.

Deadlines

Students must observe all deadlines. All documentation must be submitted to the Admissions Office, MacKimmie Block 117, 2500 University Drive NW, Calgary, AB, T2N 1N4.

North American Applicants (Fall Term)

Application Deadline:

- Refer to the Prospective Students link at: ucalgary.ca/prospectivestudents/

Transcript Deadline:

- June 30 of the application year for transfer students to submit all supporting documents including transcripts, course outlines, change of grade forms and results from deferred examinations.
- August 1 for high school transcripts from applicants completing high school in June of the application year.

International Applicants from outside North America (Fall Term)

- International applicants from outside North America will have earlier deadlines and must consult with the Admissions Office.

The Haskayne School of Business does not admit students to the Summer (Spring/Summer Intersession) or Winter Terms.

Open Studies and Visiting Students

Applicants are referred to the Undergraduate Admissions section of this Calendar, A.14 Admission to Open Studies, where more in-

formation is given on entering the University under these categories.

Applicants who wish to complete Haskayne School of Business courses as Open Studies or Visiting students (bona fide students of another institution), are required to submit the appropriate application by the deadline indicated in the Undergraduate Admissions section of this Calendar. All transcripts supporting the application form must be attached.

Enrolment in the majority of Haskayne School of Business courses is limited to students formally admitted into the school's degree programs, or accepted as Visiting Exchange students on a Haskayne-approved partner exchange agreement. Open Studies Degree-Holders and other Visiting business students on Letters of Permission, may also be considered for limited-enrolment courses.

Students who do not meet the requirements mentioned above will only be permitted to register in Management and Society (MGSO) Minor courses.

In all cases, registration under these admission categories will be subject to space availability and the applicant meeting University of Calgary rules and regulations, including course requisites.

Students not formally admitted into the Haskayne School of Business degree programs will be limited in enrolment to a maximum of 30 units (5.0 full-course equivalents) in the business school at the University of Calgary.

Students are advised to contact the Haskayne Undergraduate Programs Office for further details.

3.2 Registration

Accuracy of Registration

Students are responsible for the completeness and accuracy of their registration and for arranging their program to meet all requirements as detailed in this Calendar. Students should, however, seek advice from the business school concerning their choice of courses. In cases of doubt about the interpretation of regulations, a student should consult the Haskayne Undergraduate Programs Office and in any case is strongly advised to do this prior to registration in the final courses towards a degree to ensure that all graduation requirements will be met.

3.3 Course Work

Course Load

A student wishing to complete more than the normal load of 15 units (2.5 full-course equivalents) per Fall or Winter term must receive special permission from the Haskayne Undergraduate Programs Office. Permission will not be granted for the business school admission term.

Enrolment in Commerce Courses

1. Registration in commerce courses will be limited to students registered in the Haskayne School of Business with the exception of courses described in the Minor in Management and Society program.

2. Yearly enrolment restrictions may be placed by the Business School on high demand courses.

3. In selecting courses, students must take cognizance of prerequisites for each course. Only with the written permission of the Associate Dean (Undergraduate Programs), Haskayne School of Business, upon the recommendation of the area chair and instructor of the course, will stated prerequisites be waived. Permission is only granted under exceptional circumstances. However, should a student fail to achieve satisfactory standing in any course for which the stated prerequisite(s) is (are) lacking, they may be required to successfully complete the stated prerequisite(s) prior to being permitted to repeat the course.

4. Students are not permitted to register in courses when less than a "C-" grade or equivalent was received in a prerequisite course.

Enrolment in Non-Commerce Courses

For the purpose of satisfying breadth requirements in the Bachelor of Commerce or Bachelor of Hotel and Resort Management degree programs, the business school has classified specific non-Haskayne subjects into clusters. The clusters include both subjects offered at the University of Calgary and subjects that may have been awarded for coursework completed at other institutions prior to a student's admission or while on a Letter of Permission following admission.

Notwithstanding a listing on the table below, there is no obligation on the part of the Faculty offering the subject to allow registration. In selecting non-Haskayne options, students are cautioned that not all courses falling under a listed subject may be acceptable towards their program or available for registration. Program regulations, course enrolment restrictions and requisites may all impact a student's ability to register and/or use a particular course towards fulfillment of a business program requirement. To ensure appropriate course selection, students are strongly encouraged to discuss their course choices with advisors in the Haskayne Undergraduate Programs Office, and review program requirements on the web-based degree audit and academic planning tool, Degree Navigator.

See the **Non-Haskayne Option Clusters Chart**.

Credit in Courses by Special Assessment

Students are referred to the Academic Regulations section of this Calendar for University regulations on obtaining course credits by special assessment (see B.10.1).

Application must be made on the form headed "Credit by Special Assessment" and signed by the Haskayne Undergraduate Programs Office. Students will be considered in light of their background and the program regulations.

A course previously failed or one in which a higher grade is sought may not be taken subsequently by special assessment, nor may any course be attempted more than once in this way. No more than 12 units (2.0 full-course equivalents) completed by special assessment may be counted towards a degree.

Withdrawals

A student is entitled to withdraw from any course up to and including the last day for withdrawals as indicated in the current Academic Schedule.

Students will not be permitted to withdraw more than once from a particular course. Students will be required to withdraw if they have accumulated a total of more than 30 units (5.0 full-course equivalents) withdrawals while in attendance at the University of Calgary.

Repetition of Courses

A student may repeat a course previously attempted (excluding withdrawals) only once. This regulation applies not only to individual courses, but also to sets of courses where it is stated that credit for more than one of the sets is not allowed. To repeat a course more than once will require the permission of the Haskayne Undergraduate Programs Office and the department offering the course. Per-

Non-Haskayne Option Clusters for the Bachelor of Commerce or Bachelor of Hotel and Resort Management

Fine Arts Option	Humanities Option	Science Option	Social Sciences Option	Non-Commerce Option
ARHI, ART, DNCE, DRAM, FINA, MUED, MUPF, MUSI	CHIN, COLT, ENCO, ENGL, FOLA, FREN, GERM, GREK, GRST, HUMN, ITAL, JPNS, LATI, PHIL, RELS, ROST, RUSS, SLAV, SPAN, TAP201, TAP203, TAP301, TAP303	ASPH, ASTR, BCEM, BIOL, CHEM, CMMB, ECOL, GLGY, GOPH, PHYS, PLBI, SCIE, ZOOL	ANTH, ARKY, ECON (maximum of one three-unit course), GEOG, HTST, INDL, INTR, LING, POLI, PSYC, SOCI, SOSC, UBST	Includes subjects listed under the Fine Arts, Humanities, Science and Social Sciences Option Clusters plus the following: ACSC, AFST, AMAT, ARST, CEST, CMCL, CNST, COMS, CPSC, DEST, EAST, FILM, HSOC, INDG, INNO, KNES, LAST, LWSO, MATH, MHST, PMAT, SAST, SOWK, STAS, WMST

Additional cluster-appropriate subjects not listed above may be permitted with approval from the office of the Associate Dean (Undergraduate Programs), Haskayne School of Business.

mission is only granted under exceptional circumstances.

Students who unsuccessfully repeat a course that is required for graduation will be dismissed from the business school.

3.4 Student Standing

Grades

The official grading system of the University of Calgary is given in the Academic Regulations section of this Calendar.

Dean's List

The Dean's List recognizes outstanding academic performance while registered in the Haskayne School of Business. It is compiled twice yearly at the end of each of the Fall and Winter Terms. To qualify for inclusion, a Bachelor of Commerce or Bachelor of Hotel and Resort Management student must achieve a grade point average of 3.70 or better on 15 units (2.5 full-course equivalents) or more taken in either the Fall or Winter Term at the University of Calgary. Eligibility for those students registered in full-year courses spanning two terms will be determined at the end of the Winter Term. Students on academic sanction are not eligible for the Dean's List.

Degree "With Distinction" upon Graduation

Bachelor of Commerce

The notation "With Distinction" will be entered in the permanent record and on the graduation parchment of a student who successfully completes the Bachelor of Commerce program with a grade point average of at least 3.60 over the last 90 units (15.0 full-course equivalents) of the 120 units (20.0 full-course equivalents) applicable to the degree. In cases in which the "last 90" must include some but not all of a group of courses taken concurrently, the selection will be made in the manner most advantageous to the student. A student who has taken part of their course work at another institution may be granted a degree "With Distinction" at the discretion of the business school.

Bachelor of Hotel and Resort Management

The notation "With Distinction" will be entered in the permanent record and on the graduation parchment of a student who successfully completes the Bachelor of Hotel and Resort Management program with a grade point average of at least 3.60 over the required 60 units (10.0 full-course equivalents) post-diploma courses applicable to the degree.

Student Probation and Dismissal

Academic performance is assessed following the term in which 18 units (3.0 full-course equivalents) or more are completed by the student at the University of Calgary since the previous Haskayne appraisal. All courses taken since the previous Haskayne appraisal will be included in the next subsequent review.

If fewer than 18 units (3.0 full-course equivalents) have been completed since the previous Haskayne appraisal, the existing status is retained by the student until the next subsequent review.

For unconditional progress through the Bachelor of Commerce and Bachelor of Hotel and Resort Management programs students must earn a grade point average of no less than **2.00.**

Students who earn a grade point average of less than **1.70** on 18 units (3.0 full-course equivalents) or more taken since their previous Haskayne appraisal, will be required to withdraw from the business school.

Students who earn a grade point average of at least **1.70** but less than **2.00** on 18 units (3.0 full-course equivalents) or more taken since their previous Haskayne appraisal, will be placed on probation for the next term in which they register.

Students who earn a grade point average of less than **2.00** on 18 units (3.0 full-course equivalents) or more taken since their previous Haskayne appraisal and while on probation, will be required to withdraw from the business school. Students will be removed from probation by achieving a **2.00** or better grade point average on 18 units (3.0 full-course equivalents) or more taken since they were placed on probation.

Students required to withdraw from the Haskayne School of Business for unsatisfactory academic performance must wait a minimum of 12 months from the date of withdrawal to reapply, at which time they will be considered for admission at the next admission cycle together with new transfer applicants. Re-applicants will be required to meet the transfer admission standards prior to being readmitted. Students who are readmitted after having been required to withdraw from the Haskayne School of Business will be placed on probation for the next term in which they register.

Notes:

1. **Notwithstanding the above regulations**, students who unsuccessfully repeat a course that is required for graduation, as outlined earlier in 3.3 Course Work, "Repetition of Courses", will be required to withdraw from the business school following the term in which the unsuccessful repetition occurred.

2. Students are referred to section F. Academic Standing in the Academic Regulations section of this Calendar for additional University regulations including the maximum number of probationary periods permitted while registered as undergraduates.

3.5 Appeals Process

Rights of Appeal

A student may appeal the requirement to withdraw from the business school. The deadline for appeals is 15 calendar days (including Saturdays, Sundays and holidays) from the date of the letter advising the student of their status. The student must submit a letter to the Associate Dean (Undergraduate Programs), Haskayne School of Business, clearly stating the extenuating circumstances which are the grounds for the appeal. Additional appeal information may be found in I. Reappraisal of Grades and Non-Disciplinary Academic Appeals in the Academic Regulations section of this Calendar.

4. Program Details

4.1 Bachelor of Commerce (BComm)

4.1.1 BComm Requirements for Direct Entry Students

Admission

Applicants planning to enter the BComm program from high school must present English Language Arts 30-1, Mathematics 30-1 or equivalent, and three additional academic subjects at the 30-level approved by the Haskayne School of Business (see Undergraduate Admissions section of this Calendar for more details). To be eligible for first year admission consideration, applicants must be coming directly from high school and/or presenting no more than 6 units (1.0 full-course equivalent) of transferable post-secondary courses (including University of Calgary courses).

Assistance in program planning is available through the Haskayne Undergraduate Programs Office.

Recommended Program Sequence - Year 1

(Transfer applicants refer to 4.1.2 BComm Pre-Commerce Requirements for Transfer Students for admission requirements. Only those students already admitted into the BComm program may follow the sequence below.)

Students directly admitted from high school are advised to complete up to 30 units (5.0 full-course equivalents) over the Fall and Winter Terms of their first year as outlined below. Ahead of registration, students are cautioned to consult course descriptions. The pre- or co-requisites listed within each course description (if any), will drive the selection and term sequencing, not the order in which the requirements appear in the following lists.

It is recommended that the following graduation requirements be taken in first year:

1. Economics 201
2. Economics 203
3. Junior English
4. Management Studies 217
5. Mathematics 249 or 265
6. Statistics 213
7. Strategy and Global Management 217

In addition to the 21 units (3.5 full-course equivalents) listed above, up to 9 units (1.5 full-course equivalents) may be selected from the list below in order to complete Year 1 registration:

1. Accounting 217
2. Statistics 217
3. Junior Humanities or Fine Arts Option[1]
4. Junior Science Option[1,2,3]
5. Junior Social Sciences Option[1]

6. Junior Non-Commerce Option[1]

Note: First-year students are restricted to junior (200-level) courses in their first year. Prior to registering in senior (300-level) courses, 18 units (3.0 full-course equivalents) at the junior level must be successfully completed.

[1]Students are advised to refer to 3.3 Course Work "Enrolment in Non-Commerce Courses" for option selection. Only one Economics course can be used towards the Non-Commerce Options or Social Sciences Options in the Bachelor of Commerce degree. Junior or Senior Non-Commerce Options cannot be Statistics.

[2]Excluding Actuarial Science, Applied Mathematics, Computer Science, Mathematics, Pure Mathematics and Statistics.

[3]Students who wish to pursue a Concentration in Petroleum Land Management are advised that a 200-level course in Geology is recommended prior to registration in the introductory Petroleum Land Management courses.

4.1.2 BComm Pre-Commerce Requirements for Transfer Students

Admission

1. A prospective student presenting more than 6 units (1.0 full-course equivalent) transferable courses from a post-secondary institution (including the University of Calgary), and applying to transfer into the BComm program, must first successfully complete a minimum of 18 prescribed units (3.0 full-course equivalents) by the end of the Winter Term (January - April) of the year of application.

Assistance in program planning is available through the Haskayne Undergraduate Programs Office.

2. A maximum of 12 units (2.0 full-course equivalents) with "D" or "D+" grades may be used to fulfill commerce requirements. The "D" or "D+" grades cannot be in prerequisite courses or in the junior English course. The minimum grade required in a prerequisite course is "C-", unless the course serves as the prerequisite to the concentration sought. In this case it must be a "C". The minimum grade required in the junior English course is a "C-".

3. Admission to the Haskayne School of Business will be based on the calculation of the grade point average over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) (University of Calgary courses and/or transfer courses taken at other institutions). All grades within a term will be included except where the number of courses taken within a term exceeds that required to fulfill (to a maximum of) 30 units (5.0 full-course equivalents), in which case the highest grades will be used. Spring Intersession courses taken after May 1 in the year of admission will not be used in the calculation of the grade point average.

4. Admission is competitive. For consideration, applicants must have a minimum grade point average of 2.50 (calculated as outlined in point 3. above). The final minimum average required to secure an offer of admission will be determined once the qualifications of the applicant pool have been assessed.

5. Transfer applicants must present official transcripts to the Office of the Registrar indicating time spent and grades received in all courses being presented to satisfy pre-commerce requirements or for advanced standing in the Bachelor of Commerce program.

6. Those applicants attending Spring Intersession in order to complete courses other than the 18 prescribed units (3.0 full-course equivalents) mentioned above, if admitted, will be admitted provisionally subject to successful academic standing and continued compliance with program regulations.

7. Courses or their equivalents presented to fulfill pre-commerce requirements must not have been repeated more than once.

Requirements

(For combined degree requirements, please refer to 4.3 Combined Degrees in this section of the Calendar.)

The following 18 prescribed units (3.0 full-course equivalents) must be successfully completed by the end of the Winter Term (January - April) of the year of application:

1. Economics 201
2. Mathematics 249 or 265 or equivalent
3. Statistics 213
4. Junior English
5. Economics 203
6. Statistics 217

In addition, the 12 units (2.0 full-course equivalents) below fulfill BComm graduation requirements and it is strongly recommended that these be taken to complete a prospective student's remaining Year 1 registration:

1. Junior Humanities or Fine Arts Option[1]
2. Junior Science Option[1,2,3]
3. Junior Social Sciences Option[1]
4. Junior Non-Commerce Option[1]

Note: These courses need not necessarily be taken in the sequence indicated. Students should consult course descriptions in the latter section of this Calendar for prerequisites.

[1]Students are advised to refer to 3.3 Course Work "Enrolment in Non-Commerce Courses" for option selection. Only one Economics course can be used towards the Non-Commerce Options or Social Sciences Options in the Bachelor of Commerce degree. Junior or Senior Non-Commerce Options cannot be Statistics.

[2]Excluding Actuarial Science, Applied Mathematics, Computer Science, Mathematics, Pure Mathematics and Statistics.

[3]Students who wish to pursue a Concentration in Petroleum Land Management are advised that a 200-level course in Geology is recommended prior to registration in the introductory Petroleum Land Management courses.

4.1.3 BComm Graduation Requirements

Requirements for the Bachelor of Commerce degree program changed significantly effective Fall 2013. Candidates for the degree will fall under one of the two regulation sets listed below and must fulfill all requirements of the set into which they fall as outlined.

Candidates with Successful Completion of Business and Environment 291 or Equivalent

Candidates for the degree who successfully completed Business and Environment 291 (now discontinued) or equivalent prior to or following admission into the business school, must fulfill the following requirements:

1. An approved program with a minimum of 120 units (20.0 full-course equivalents). A minimum grade point average of 2.00 must be achieved over all 120 units.

2. A minimum of "C-" grade in the Junior English, Management Studies 493, 495, Strategy and Global Management 591 and in each course permitted to fulfill the concentration requirements. A maximum of 12 units (2.0 full-course equivalents) with "D" or "D+" grades in non-concentration and non-prerequisite courses.

3. A maximum of 60 units (10.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be counted toward the Bachelor of Commerce Degree. A maximum of 18 units (3.0 full-course equivalents) taken at other institutions and acceptable for transfer credit as Haskayne School of Business courses may be counted toward the Bachelor of Commerce Degree.

4. Students are permitted a maximum of 9 units (1.5 full-course equivalents) in Economics, including Economics 201 and 203, unless the course satisfies a specified concentration requirement.

5. The following courses or their equivalents presented for graduation must be completed within 10 years or less of the graduation date: Communication and Media Studies 363 or 369, Computer Science 203, Mathematics 249 or 265, Economics 201 and 203, Statistics 213 and 217, and all Commerce courses.

The following courses, or their equivalents, constitute the Bachelor of Commerce program:

Commerce Courses (60 units or 10.0 full-course equivalents)

1. Business and Environment 291
2. Accounting 317
3. Accounting 323
4. Business and Environment 395
5. Business Technology Management 317
6. Finance 317
7. Human Resources and Organizational Dynamics 317
8. Marketing 317
9. Operations Management 317
10. Management Studies 391
11. Management Studies 493 and 495 (1.5 units or quarter courses)
12. Strategy and Global Management 591

13.-18. Concentration: (18 units or 3.0 full-course equivalents) from one Concentration (listed below)

19. Senior Commerce Option* (3 units or 0.5 full-course equivalent)
20. Senior Commerce Non-Concentration Option (3 units or 0.5 full-course equivalent)

Non-Commerce Courses (60 units or 10.0 full-course equivalents)

1. Computer Science 203

2. Economics 201

3. Economics 203

4. Mathematics 249 or 265

5. Statistics 213

6. Statistics 217

7. Junior English (3 units or 0.5 full-course equivalent)

8. Junior Humanities or Fine Arts Option (3 units or 0.5 full-course equivalent)

9. Junior Science Option** (3 units or 0.5 full-course equivalent)

10. Junior Social Sciences Option (3 units or 0.5 full-course equivalent)

11.-12. Junior Non-Commerce Option (6 units or 1.0 full-course equivalent)

13. Communication and Media Studies 363 or 369

14.-15. Senior Humanities, Social Sciences, Science** or Fine Arts Option (6 units or 1.0 full-course equivalent)

16.-20. Senior Non-Commerce Options (15 units or 2.5 full-course equivalents)

Notes:

*Concentration course may be required.

**Excluding Actuarial Science, Applied Mathematics, Computer Science, Mathematics, Pure Mathematics and Statistics.

Junior = 200-level and Senior = 300-level and above

Refer to 3.3 Course Work "Enrolment in Non-Commerce Courses" for option selection. Only 3 units (0.5 full-course equivalent) Economics course can be used towards the Non-Commerce Options or Social Sciences Options. Non-Commerce Options cannot be Statistics.

Course sequencing information for students is available in the Haskayne Undergraduate Programs Office.

All Other Candidates

All other candidates for the Bachelor of Commerce degree who did not complete Business and Environment 291 must fulfill the following requirements:

1. An approved program with a minimum of 120 units (20.0 full-course equivalents). A minimum grade point average of 2.00 must be achieved over all 120 units.

2. A minimum of "C-" grade in the Junior English, Entrepreneurship and Innovation 317, Management Studies 451, 453, Strategy and Global Management 591 and in each course permitted to fulfill the concentration requirements. A maximum of 12 units (2.0 full-course equivalents) with "D" or "D+" grades in non-concentration and non-prerequisite courses.

3. A maximum of 60 units (10.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be counted toward the Bachelor of Commerce Degree. A maximum of 18 units (3.0 full-course equivalents) taken at other institutions and acceptable for transfer credit as Haskayne School of Business courses may be counted toward the Bachelor of Commerce Degree.

4. Students are permitted a maximum of 9 units (1.5 full-course equivalents) in Economics, including Economics 201 and 203, unless the course satisfies a specified concentration requirement.

5. The following courses or their equivalents presented for graduation must be completed within 10 years or less of the graduation date: the 3 units (0.5 full-course equivalent) Junior English, Mathematics 249 or 265, Economics 201 and 203, Statistics 213 and 217, and all Commerce courses.

The following courses, or their equivalents, constitute the Bachelor of Commerce program:

Commerce Courses (63 units or 10.5 full-course equivalents)

1. Management Studies 217

2. Strategy and Global Management 217

3. Accounting 217

4. Accounting 323

5. Business and Environment 395

6. Business Technology Management 317

7. Entrepreneurship and Innovation 317

8. Finance 317

9. Human Resources and Organizational Dynamics 317

10. Marketing 317

11. Operations Management 317

12. Management Studies 391

13. Management Studies 451

14. Management Studies 453

15. Strategy and Global Management 591

16.-21. Concentration: (18 units or 3.0 full-course equivalents) from one Concentration (listed below)

Non-Commerce Courses (48 units or 8.0 full-course equivalents)

1. Economics 201

2. Economics 203

3. Junior English (3 units or 0.5 full-course equivalent)

4. Mathematics 249 or 265

5. Statistics 213

6. Statistics 217

7. Junior Humanities or Fine Arts Option (3 units or 0.5 full-course equivalent)

8. Junior Science Option* (3 units or 0.5 full-course equivalent)

9. Junior Social Sciences Option (3 units or 0.5 full-course equivalent)

10. Junior Non-Commerce Option (3 units or 0.5 full-course equivalent)

11.-12. Senior Humanities, Social Sciences, Science* or Fine Arts Option (6 units or 1.0 full-course equivalent)

13.-16. Senior Non-Commerce Options (12 units or 2.0 full-course equivalents)

Commerce or Non-Commerce Courses (9 units or 1.5 full-course equivalents)

1.-3. Senior Commerce or Non-Commerce Options** (9 units or 1.5 full-course equivalents)

Notes:

*Excluding Actuarial Science, Applied Mathematics, Computer Science, Mathematics, Pure Mathematics and Statistics.

**Concentration course may be required.

Junior = 200-level and Senior = 300-level and above

Refer to 3.3 Course Work "Enrolment in Non-Commerce Courses" for option selection. Only 3 units (0.5 full-course equivalent) Economics course can be used towards the Non-Commerce Options or Social Sciences Options. Non-Commerce Options cannot be Statistics.

Course sequencing information for students is available in the Haskayne Undergraduate Programs Office.

4.1.3.1 Concentrations

The concentration program must be approved by the business school. Certain courses in a concentration may be compulsory. Information on concentrations is available from the office of the Associate Dean (Undergraduate Programs).

Bachelor of Commerce Concentrations are available in the areas of:

- Accounting
- Business Process Management
- Business Technology Management
- Energy Management
- Entrepreneurship and Innovation
- Finance
- General
- Human Resources and Organizational Dynamics
- International Business
- Marketing
- Operations Management
- Personal Financial Planning
- Petroleum Land Management
- Risk Management and Insurance
- Risk Management: Insurance and Finance
- Supply Chain Management (formerly Transportation and Logistics)
- Tourism Management
- Tourism Management and Marketing

Bachelor of Commerce Concentration Requirements

In order to pursue any concentration in the Bachelor of Commerce program, students must achieve a minimum grade of "C" in the required core course(s) which is (are) prerequisite(s) for that concentration: Accounting 217 or 317, and 323; Business Technology Management 317; Energy Management 301 and 403; Entrepreneurship and Innovation 381; Finance 317; Human Resources and Organizational Dynamics 317; Marketing 317; Operations Manage-

ment 317; Risk Management and Insurance 317; Petroleum Land Management 475 and 477; Tourism Management 309.

Accounting (ACCT)

Accounting 341
Accounting 343
Accounting 361
Accounting 445 or 465
Accounting 400- or 500-level
Accounting 400- or 500-level

Note: Students should complete Accounting 323 before Year 3.

Business Process Management (BPMA)

Business Technology Management 333
Operations Management 403
One of:
Business Technology Management 455
Operations Management 411
One or Two of:
Business Technology Management 463
Business Technology Management 465
Human Resources and Organizational Dynamics 403
Human Resources and Organizational Dynamics 493
Operations Management 405
Operations Management 407
One or Two of:
Business Technology Management 331
Business Technology Management 459
Business Technology Management 461
Business Technology Management 467
Operations Management 409
Operations Management 413
Operations Management 415

Note: Maximum of one Human Resources and Organizational Dynamics course, maximum of three Operations Management courses, and maximum of three Business Technology Management courses.

Business Technology Management (BTMA)

Business Technology Management 331
Business Technology Management 333
Business Technology Management 400- or 500-level
Business Technology Management 400- or 500-level
Business Technology Management 400- or 500-level
400- or 500-level Commerce Option (including Business Technology Management)

Energy Management (ENMG)

Students are advised that admission to the Concentration is competitive and meeting the minimum Bachelor of Commerce requirements does not guarantee admission.

Energy Management 301
Energy Management 403
Energy and Environment Engineering 355
Energy Management 485
Two of:
Energy Management 487
Energy Management 489
Finance 445
Finance 467
Human Resources and Organizational Dynamics 493
Management Studies 597.17
Operations Management 407

Entrepreneurship and Innovation (ENTI)

Entrepreneurship and Innovation 381
Entrepreneurship and Innovation 401
Entrepreneurship and Innovation 403
Entrepreneurship and Innovation 405
Two of:
Business and Environment 595 (formerly 559.12)
Entrepreneurship and Innovation 559
Finance 473
Human Resources and Organizational Dynamics 401
Human Resources and Organizational Dynamics 493
Marketing 465

Finance (FNCE)

Finance 451
Finance 400- or 500-level
Finance 400- or 500-level
Finance 400- or 500-level
Finance 400- or 500-level
One of:
Economics 301
Economics 303
Economics 341
Economics 373
Economics 387
Economics 395

General (GENL)

Combination of 18 units (3.0 full-course equivalents) Senior Commerce courses from two or more areas.

Human Resources and Organizational Dynamics (HROD)

Human Resources and Organizational Dynamics 401
Human Resources and Organizational Dynamics 403
Human Resources and Organizational Dynamics 405
Human Resources and Organizational Dynamics 400- or 500-level
Two of:
Senior Commerce Options (Risk Management and Insurance 449 is recommended)

International Business (IBUS)

Strategy and Global Management 575
Strategy and Global Management 577 (formerly 559.01)
One of:
Strategy and Global Management 579 (formerly 559.02)
Finance 461
Marketing 467
One of (not used above):
Finance 461
Management Studies 571
Marketing 467
Risk Management and Insurance 559.02*
Strategy and Global Management 571
Strategy and Global Management 573
Strategy and Global Management 579 (formerly 559.02)
Two courses in ONE of the following major international business languages:
Chinese, French, German, Japanese, Russian, or Spanish. Courses selected cannot be literature or culture studies based, and cannot be taught in English.

Note: It is strongly recommended that the Strategy and Global Management courses be taken in the sequence of 575 followed by 577 followed by 579.

**Overseas component*

Marketing (MKTG)

Marketing 465
Marketing 493
Marketing 400-level
Marketing 400-level
Marketing 400- or 500-level
Marketing 400- or 500-level

Note: Maximum of two 500-level Marketing courses.

Operations Management (OPMA)

Operations Management 400- or 500-level
Operations Management 400- or 500-level
Operations Management 400- or 500-level
Operations Management 400- or 500-level
Operations Management 400- or 500-level
One of:
Accounting 361
Business Technology Management 333
Business Technology Management 459
Business Technology Management 465
Business Technology Management 467
Economics 311
Economics 373
Economics 395
Engineering 481
Entrepreneurship and Innovation 381
Entrepreneurship and Innovation 401
Entrepreneurship and Innovation 405
Finance 479
Human Resources and Organizational Dynamics 403
Marketing 465
Marketing 479

Personal Financial Planning (PFPL)

Risk Management and Insurance 317

Finance 443

Finance 463

Finance 477 (formerly Management Studies 577)

Risk Management and Insurance 439

Risk Management and Insurance 449

Note: It is recommended that Finance 477 be taken after all other required Concentration courses and that Accounting 421 be taken as a Senior Commerce Option.

Petroleum Land Management (PLMA)

Students are advised that admission to the Concentration is competitive and meeting the minimum Bachelor of Commerce requirements does not guarantee admission. Admission is determined by the PLMA Director.

Petroleum Land Management 475

Petroleum Land Management 477

Petroleum Land Management 573

Petroleum Land Management 579

Petroleum Land Management 583

Petroleum Land Management 587

Risk Management and Insurance (RMIN)

Risk Management and Insurance 317

Risk Management and Insurance 439

Risk Management and Insurance 449

Risk Management and Insurance 459

Risk Management and Insurance 579

One of:

Accounting 421

Economics 341

Finance 443

Finance 445

Finance 451

Finance 461

Finance 463

Finance 475

Risk Management and Insurance 559

Risk Management: Insurance and Finance (RMIF)

Risk Management and Insurance 317

Finance 451

Four of:

(One must be Finance and two must be 400- or 500-level Risk Management and Insurance. Maximum one of Finance 479 or Risk Management and Insurance 579.)

Economics 341

Energy Management 487

Finance 443

Finance 445

Finance 447

Finance 449

Finance 461

Finance 463

Finance 467

Finance 475

Finance 479

Risk Management and Insurance 459

Risk Management and Insurance 559

Risk Management and Insurance 579 (formerly 559.01)

Supply Chain Management (SCMA)

Operations Management 401

Operations Management 417 (formerly 559.03)

Four of:

(Two must be Haskayne School of Business courses and one must be a course from outside the Haskayne School of Business.)

Economics 321

Economics 323

Economics 371

Geography 341

Human Resources and Organizational Dynamics 493

Management Studies 571

Marketing 433

Marketing 467

Operations Management 411

Operations Management 415

Strategy and Global Management 571

Strategy and Global Management 575

Tourism Management (TOUR)

Students are advised that admission to the Concentration is competitive and meeting the minimum Bachelor of Commerce requirements does not guarantee admission.

Tourism Management 309

Tourism Management 419

Tourism Management 449

Three of:

Tourism Management 429

Tourism Management 439

Tourism Management 469

Tourism Management 479

Tourism Management 499

Note: Students are advised to complete Tourism Management 309 as soon as possible.

Tourism Management and Marketing (TRMK)

Tourism Management 419

Tourism Management 449

Tourism Management 400-level*

Marketing 465

Marketing 400- or 500-level

Marketing 400- or 500-level

Note: Students are advised that Tourism Management 309 is a prerequisite to the Tourism courses and must be taken in lieu of an open Senior Commerce Option for this Concentration.

**Except Tourism Management 409 which is not for credit in the Bachelor of Commerce.*

4.1.3.2 Minor Field

A student may formally declare a Minor Field within the Bachelor of Commerce degree program and have this officially recorded on the transcript of record, provided that at least 30 units (5.0 full-course equivalents) in the field as specified by the Faculty offering the Minor are completed. This declaration must be made no later than the time of the last registration. Minors in Economics, Statistics, Management and Society, and Workplace Learning are not permitted. Consultation with the Haskayne Undergraduate Programs Office regarding choices for a Minor is required.

4.2 Bachelor of Hotel and Resort Management (BHRM)

Introduction

The intent of the degree is to develop students with both a skills-based and management theory education, who have the potential to assume senior positions in the hospitality industry (specifically in the accommodation and food and beverage sectors).

Admission Requirements

The Bachelor of Hotel and Resort Management (BHRM) is currently suspended. No new admissions will be permitted.

Application for admission to the Bachelor of Hotel and Resort Management program will be processed only once each year for the Fall Term (September). Applications for admission will not be accepted for the Winter Term, Spring or Summer Intersession January, May or July). Applicants are considered for admission to third year of the BHRM degree program only.

1. Applicants must meet minimum admission requirements as noted in the Undergraduate Admissions section of this Calendar. Applicants must present Alberta Grade XII English Language Arts 30-1 and Mathematics 30-1 (or equivalents) with no grade lower than 50 per cent.

2. Applicants must present a diploma in Hospitality Management or equivalent from an approved recognized institution, with a cumulative grade point average of at least 3.00.

Application and documentation deadlines for admission to the Bachelor of Hotel and Resort Management degree:

- Refer to the Application for Admission Schedule in this Calendar for application deadlines
- June 30 for all supporting transcripts and documentation

Upon admission to the Bachelor of Hotel and Resort Management program, each student will complete a balanced core curriculum of general commerce courses, tourism management courses, and non-commerce courses. Assistance in program planning is available through the Haskayne Undergraduate Programs Office. The curriculum provides for a balanced program fulfilling the business school objective of a strong general educational background to complement the high degree of specialization previously undertaken in the diploma program.

The Haskayne School of Business has a quota on the number of students accepted into the Bachelor of Hotel and Resort Management program. Admission will be competitive, based on academic performance on courses presented as part of the diploma program. Applicants will be asked to respond to an offer of acceptance within a three week period. The admission procedures will be the responsibility of the Haskayne Undergraduate Programs Office.

Graduation Requirements

All candidates for the Bachelor of Hotel and Resort Management degree must fulfill the following requirements:

1. An approved recognized diploma in Hospitality Management or equivalent (as determined by the Director of the Bachelor of Hotel and Resort Management degree program) and an approved program with a minimum of 60 units (10.0 full-course equivalents) with passing grades.

2. Completion of 60 units (10.0 full-course equivalents) in the Bachelor of Hotel and Resort Management program must be Haskayne School of Business and University of Calgary courses.

3. A minimum cumulative grade point average of 2.00 in all 60 units (10.0 full-course equivalents) taken to satisfy the requirements of the Bachelor of Hotel and Resort Management program.

4. Completion of courses for the fulfillment of program requirements must occur within four years of the date of registration in the Bachelor of Hotel and Resort Management program (Year 3).

5. A maximum of 6 units (1.0 full-course equivalent) with "D" or "D+" grades in the Bachelor of Hotel and Resort Management program. The "D" or "D+" grades cannot be in Tourism Management or prerequisite courses.

The following courses make up the Bachelor of Hotel and Resort Management program.

Note: Years 1 and 2 are completed in one of the approved recognized diploma programs.

Year 3

1. Tourism Management 469
2. Finance 341
3. 400- or 500-level Marketing Option
4. Computer Science 203 or Junior Non-Commerce Option[1]
5. Junior Non-Commerce Option[1]
6. Tourism Management 419
7. Tourism Management 499
8. Human Resources and Organizational Dynamics 317
9. Communication and Media Studies 363 or 369
10. Junior or Senior Non-Commerce Option[1]

Year 4

1. Tourism Management 429
2. Tourism Management 449
3. Business Technology Management 317
4. Junior or Senior Non-Commerce Option[1]
5. Senior Non-Commerce Option[1]
6. Tourism Management 439
7. Tourism Management 479
8. Strategy and Global Management 575 or 577 or Senior Commerce Option[2]
9. Senior Commerce Option[2]
10. Senior Non-Commerce Option[1]

[1]Refer to 3.3 Course Work "Enrolment in Non-Commerce Courses" for option selection.

All Non-Commerce courses selected must be approved by the Haskayne School of Business. Students who assess their skills in databases or spreadsheets as weak are strongly encouraged to take Computer Science 203. It is recommended that students devote 12 units (2.0 full-course equivalents) to the study of a second language (particularly French, Spanish, German, Chinese or Japanese).

[2]Students are encouraged to take Business and Environment 395. Tourism Management courses are excluded. Commerce options must be approved by the Haskayne Undergraduate Programs Office.

4.3 Combined Degrees

General Requirements

Students may elect to complete the Bachelor of Commerce degree in combination with another approved undergraduate degree. Five-year combined degree programs are sponsored jointly by the Haskayne School of Business and a second Faculty, and lead to two Bachelors' degrees awarded at the same convocation ceremony. The program is comprised of a minimum of 150 units (25.0 full-course equivalents), including all requirements of the two Faculties.

Students wishing to embark on the courses leading to a combined degree are strongly advised to enter the five year program directly in first year. The admission criteria that apply to the singular Bachelors' degrees apply equally to the direct entry combined degree program.

Students that are not admissible or defer entering the Haskayne School of Business directly may apply for combined degree admission in a subsequent year, upon successful completion of a prescribed set of pre-commerce requirements. Fewer spaces exist for transfer entrance into the business school however, and students are cautioned that admission is highly competitive and subject to the cut-off grade point average being met.

Students already admitted into the Bachelor of Commerce and interested in transferring to a combined degree program, are required to submit a Change of Program application and meet the application deadlines and admission requirements of the intended second Faculty.

In all of the above cases, early contact with the Undergraduate Programs Offices of the two Faculties prior to registration ensures that admission and graduation requirements are met in a reasonable timeframe and within the minimum 150 units (25.0 full-course equivalents). Advisors are available to assist students with course planning and program details.

For administrative purposes, combined degree students shall be registered under the Haskayne School of Business. Students may elect to remain in the combined degree or switch to either of the two separate degree programs, as long as the requirements of each Faculty continue to be met. Failure to meet requirements will result in a student being required to withdraw from the combined or separate programs, as the case may be.

Any Bachelor of Commerce Concentration may be chosen in combination with those Majors listed below. Students wishing to also focus their non-commerce options in one area of study are cautioned that Minors in Economics, Statistics, Management and Society, and Workplace Learning are not permitted. Consultation with student advisors in the Haskayne Undergraduate Programs Office regarding choices for a Minor is required.

4.3.1 Combined BComm/BA or BSc (Arts) Program

A Major in the Arts consisting of at least 42 or 48 units (7.0 or 8.0 full-course equivalents) (depending on the Major selected) is required. Departmental and Faculty requirements as specified in the Faculty of Arts section of this Calendar must be fulfilled. Majors are available in: Ancient and Medieval History, Anthropology, Archaeology, Communication and Media Studies, Development Studies, East Asian Studies, East Asian Language Studies, Economics, English, Film Studies, French, Geography, German, Greek and Roman Studies, History, History and Philosophy of Science, International Indigenous Studies, International Relations, Italian Studies, Latin American Studies, Law and Society, Linguistics, Linguistics and Language, Music, Philosophy, Political Science, Psychology, Religious Studies, Religious Studies and Applied Ethics, Russian, Sociology, Spanish, Urban Studies and Women's Studies.

Requirements

Please consult both Faculties for specific requirements for this program.

Students in Major Programs requiring statistics-based courses should be cognizant of the exclusions listed under the Statistics subject heading in the Courses of Instruction section of the Calendar.

4.3.2 Combined BComm/BSc (Actuarial Science) Program

Requirements

Please consult both Faculties for specific requirements for this program.

In this combined degree Statistics 321 and 323 replace Statistics 213 and 217 required in the Haskayne School of Business Bachelor of Commerce program. Consequently, Statistics 213 and 217 cannot be used to satisfy other requirements of the combined degree program.

4.3.3 Combined BComm/BSc (Computer Science) Program

Requirements

Please consult both Faculties for specific requirements for this program.

4.3.4 Combined BComm/BKin (Kinesiology) Program

No major other than the BKin (Kinesiology) will be considered by the Faculty of Kinesiology.

Requirements

Please consult both Faculties for specific requirements for this program.

4.4 Co-operative Education Program

Introduction

All Bachelor of Commerce students are eligible to apply for admission to the Co-operative Education program. This program normally includes 12 to 16 months of supervised paid work experience in various private companies and government agencies in addition to the eight required academic terms.

Students who wish to pursue the Co-operative Education option are urged to discuss their course selection with the Co-op Program Co-ordinator at the Haskayne Career Centre as early in their program as possible. Bachelor of Commerce students completing the requirements of the Co-operative Education option will graduate with "Co-operative Education" designated on their parchment.

Admission

1. Prospective Business Co-operative Education students must complete a Co-operative Education application available at the Haskayne Career Centre.

2. The Haskayne School of Business has a quota on the number of students accepted into the Co-operative Education program. Admission will be competitive, based on the student's skills, attitudes and academic record. Students may be required to attend an interview to assess their suitability for admission.

3. Students should refer to 3.1 "Admissions" and 4.1 "Bachelor of Commerce (BComm)" sections of this Calendar for specific admission regulations pertaining to the Haskayne School of Business.

Requirements

1. Applications to the Haskayne Co-operative Education Program are accepted twice a year - on May 1st and December 1st. Direct entry students normally apply by December 1st of their second year in the Bachelor of Commerce Program. Transfer students normally apply by May 1st following completion of 60 units (10.0 full-course equivalents) applicable towards the Bachelor of Commerce Program.

2. Applicants must have been admitted into the Haskayne School of Business before their Co-operative Education application will be reviewed.

3. To be considered for admission applicants must have a minimum GPA of 2.50. Admission GPA is calculated on the most recent 36-45 units (6.0-7.5 full-course equivalents).

4. Before a Co-operative Education student's first work term commences, at least 54 units (9.0 full-course equivalents) and normally not more than 90 units (15.0 full-course equivalents) appropriate to the degree program must have been successfully completed, including at least one business course relating to the chosen Concentration (e.g., Accounting 217 or 317, Finance 317), and either a) Business and Environment 291, Computer Science 203, and Communication and Media Studies 363 or 369, or b) Management Studies 217, Strategy and Global Management 217 and Entrepreneurship and Innovation 317.

5. Co-operative Education students should have completed no more than 90 units (15.0 full-course equivalents) applicable to their Bachelor of Commerce before their first work term commences (consult the Co-op Program Coordinator at the Haskayne Career Centre).

Work Term Requirements

Attendance at the Career Centre workshops (Co-op New Student Orientation, Interview Skills, Co-op Best Practices and Success), or equivalent tutorials as approved by the Career Centre, is a requirement of admission and must occur before the start of the job search process.

In addition to their regular academic requirements, students pursuing the Co-operative Education designation must complete the following work term courses:

Co-operative Education 523.01, 523.02 and 523.03. Students completing back-to-back third and fourth work terms with the same employer will be registered in both Co-operative Education 523.03 and 523.04. Otherwise, Co-operative Education 523.04 may only be completed with the consent of the business school.

Regulations

In addition to the Haskayne School of Business's regulations governing the Bachelor of Commerce program and the regulations governing the Co-operative Education program, the following regulations also apply:

1. Bachelor of Commerce students are required to complete a minimum of three four-month work terms, two of which must be completed while registered in the Haskayne School of Business Co-operative Education program.

2. Students wishing to transfer the credit of Co-operative Education work terms either from other faculties within the University of Calgary or from other institutions must submit a Haskayne School of Business Co-operative Education application.

3. December 1 applicants will normally begin their first four-month work term (Co-operative Education 523.01) in the subsequent Summer (Spring/Summer Intersession) Term. May 1 applicants will normally begin their first four-month work term in the subsequent Winter Term. Students can work a maximum of two Summer (Spring/Summer Intersession) work terms, the third work term must take place in the Fall or Winter Term.

4. Sequencing of work terms with academic terms is a flexible process which depends upon the availability of work terms, length of work terms (four or eight months) and the student's academic requirements.

5. Students must end their Co-operative Education program with an academic term.

6. The Co-operative Education courses are in addition to the normal requirements for each degree, i.e., students must complete the required courses and the required number of non Co-operative Education courses as students completing the traditional degree programs.

7. Students must be registered full time during their academic terms. Students taking a vacation or a leave should inform the Co-op Program Co-ordinator. While on a four-month work term a student may take one evening or weekend academic course.

8. If a student's academic performance results in the student being required to withdraw from the Haskayne School of Business, or being placed on probation, the student will be required to withdraw from the Co-operative Education program. If the student is required to withdraw from the Co-operative Education program but has already accepted a work term, the employer will be informed that the student is no longer registered in the Co-op program. Termination of the student's employment will be at the employer's discretion.

9. While on a work term students pay an academic course fee and are considered as full-time students.

10. Upon completion of each work term, the student must present a work term report to the Co-op Program Co-ordinator at the Haskayne Career Centre.

11. Students enrolled in combined degree programs wishing to pursue the Co-operative Education designation should consult the Co-op Program Co-ordinator for regulations.

12. Students who receive a Failure (F) on a work term will be required to withdraw from the Co-operative Education program.

For further information please contact the Co-op Program Co-ordinator at the Haskayne Career Centre.

4.5 Minor in Management and Society

The Management and Society program is designed to expose students to the various aspects of the role of management in our institutions and society. The program does not portend the development of managerial competence. It is intended to prepare graduates in other disciplines for practicing their skills in a business environment.

Requirements

In order to complete the requirements for a Minor in Management and Society, students must take 30 units (5.0 full-course equiva-

lents) as outlined below, with a maximum of 15 units (2.5 full-course equivalents) transferred from an institution outside of the University of Calgary. A maximum of 6 units (1.0 full-course equivalent) with a "D" or "D+" grade in a non-prerequisite course is permitted.

Required Courses:

Entrepreneurship and Innovation 201*

Accounting 301*

One of:

Finance 341*

Finance 343*

Operations Management 301*

Seven of (not used above):

Business and Environment 395

Business and Environment 401*

Business Technology Management 321*

Entrepreneurship and Innovation 381

Entrepreneurship and Innovation 401

Entrepreneurship and Innovation 403

Entrepreneurship and Innovation 405

Finance 341*

Finance 343*

Human Resources and Organizational Dynamics 321*

Marketing 341*

Operations Management 301*

Tourism Management 409*

**Not available for credit in the Bachelor of Commerce program.*

Note: Students not admitted to the Haskayne School of Business are not permitted to take more than 30 units (5.0 full-course equivalents) from the Haskayne School of Business without the written consent of the business school.

5. Administration

Business School Administrative Officers

Dean

J. Dewald

Associate Deans

V. Jones, Academic

M. Wright, Graduate Programs

L. Falkenberg, Research

S. Radford, Teaching & Learning

S. Weaver, Undergraduate Programs

Directors

J. Woiceshyn, Graduate Thesis Programs

C. Dixon, MBA Program

Faculty of Kinesiology

1. Summary of Degree Programs

Degrees Offered

Undergraduate					
Athletic Therapy[1]	**Biomechanics**	**Exercise & Health Physiology**	**Kinesiology**	**Leadership in Pedagogy and Coaching**	**Mind Sciences in Kinesiology**
BKin	BKin[1]	BKin[1]	BKin	BKin	BKin
BKin Honours	BKin Honours[1]	BKin Honours[1]	BKin Honours	BKin Honours	BKin Honours
	BSc	BSc	BSc		BSc
	BSc Honours	BSc Honours	BSc Honours		BSc Honours
			BComm/BKin*		
			BA/BKin***	BKin/BEd**	

**Combined Degree with the Haskayne School of Business*
***Concurrent Degree (Pedagogy concentration only) with the Werklund School of Education*
****Combined Degree with the Faculty of Arts (Dance major only)*

[1]Program is currently suspended. No new admissions will be permitted.

Graduate
Kinesiology
MKin
MSc
PhD

Undergraduate

The Faculty of Kinesiology offers four-year professional and disciplinary programs.

Students may declare only one Major.

Honours programs are offered in all Majors. A maximum of 20 spaces are available each Fall.

Students who are preparing to teach in either the elementary or secondary school system should enrol in the Bachelor of Kinesiology (Leadership in Pedagogy and Coaching, Pedagogy concentration) degree program.

The Faculty of Kinesiology offers a five-year combined Bachelor of Arts (Dance)/Bachelor of Kinesiology (Kinesiology) with the Faculty of Arts, a Bachelor of Commerce/Bachelor of Kinesiology (Kinesiology) with the Haskayne School of Business and a five-year concurrent Bachelor of Kinesiology (Leadership in Pedagogy and Coaching)/Bachelor of Education in Physical Education with the Werklund School of Education. No other combined degree programs are available with Kinesiology degrees.

The Faculty of Kinesiology collaborates with the Cumming School of Medicine to offer a Minor in Adapted and Therapeutic Physical Activity for students in Kinesiology. Detailed requirements are listed in the Cumming School of Medicine section of this Calendar.

Graduate

The Faculty of Kinesiology offers graduate programs leading to the thesis-based MSc, the course-based MKin degree, and the Doctor of Philosophy (PhD) degree.

Graduate programs are administered by the Faculty of Graduate Studies, and details are given in their portion of the Academic Calendar.

2. Faculty Information

Contact Information

Location: Kinesiology B 142/143

Student Information: 403.220.7018 or 403.220.3407

Email address: knesinfo@ucalgary.ca

Website: ucalgary.ca/knes

Introduction

The origins of Kinesiology at the University of Calgary date back to 1961 when the School of Physical Education was founded. In 1994, the name was changed to the Faculty of Kinesiology. Today, the faculty's curriculum and majors are recognized and accredited by the Canadian Council of University Physical Education and Kinesiology Administrators (CCUPEKA). The curriculum is uniquely multi- and interdisciplinary. Undergraduate students study human movement from the perspectives of the natural sciences, social sciences, and humanities, with an integration of both theoretical and experiential learning components. Issues of health, wellness, and human performance are prominent in both the curriculum and research of the faculty. Kinesiology relates to the study of human movement and therefore active involvement in movement classes is part of the curriculum and an expectation of all students.

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Pattern

In addition to a core curriculum, all undergraduate students may pursue specialized areas of study.

The Bachelor of Kinesiology and Bachelor of Science in Kinesiology offers a solid foundation with depth and breadth in the Kinesiology discipline. Students may tailor their degree to meet their needs and interests. A combined Bachelor of Commerce/Bachelor of Kinesiology degree program is offered with the Haskayne School of Business and a combined Bachelor of Arts (Dance)/Bachelor of Kinesiology degree program is offered with the Faculty of Arts.

Admission to Athletic Therapy Major (BKin) is currently suspended. No new students will be admitted.

The Biomechanics Major (BSc) focuses on the mechanics of human movement with an emphasis on biomedical and sports applications, through course work in Kinesiology, Mathematics, and Engineering.

The Exercise and Health Physiology Major (BSc) builds upon fundamental knowledge in human movement and physiological functioning to understand the physiological response to exercise (from activities of daily living to high performance sport), and also the impact of exercise and diet on the physiological determinants of health and human performance across the life span.

The Mind Sciences in Kinesiology Major (BKin or BSc) provides a comprehensive education in the areas of behavioural neurosciences, cognition and neuro-motor control, and the application of personality and social psychological principles to the fields of exercise and health psychology, and sport psychology.

The Leadership in Pedagogy and Coaching Major (BKin) allows students to declare a concentration in Pedagogy or Coaching. The Pedagogy concentration addresses the teaching and learning of kinesiology content and activity for both children and adults. Teacher certification must be obtained after completing this program in order to work in the educational environment. The Coaching concentration will develop leaders from de-

velopmental to high performance coaching opportunities. Both Pedagogy and Coaching have a strong emphasis on experiential learning which includes practicum opportunities in the field. A concurrent Bachelor of Kinesiology (Pedagogy concentration only)/Bachelor of Education degree program is offered with the Werklund School of Education.

Objectives

The Kinesiology undergraduate curriculum addresses the eight core competencies endorsed by the University of Calgary. These are critical and creative thinking, problem analysis, effective communication, gathering and organizing information, abstract thinking, interpretative and assessment skills, and insight and intuition in generating knowledge. The curriculum provides an opportunity for students to acquire advanced levels of knowledge on contemporary issues related to health, movement, exercise, and sport. Laboratory, professional, and experiential courses are integral to our programs and designed to facilitate the transition from undergraduate education to the workplace and/or graduate education. Finally, the undergraduate program promotes a lifelong desire for learning, an appreciation for a healthy lifestyle, and willingness to assume leadership roles in the promotion of health, wellness, and human performance.

Career Opportunities

Graduates of Kinesiology may find employment in areas such as: teaching, corporate wellness, sport administration and marketing, management, fitness assessment and exercise prescription, health promotion, coaching and training of amateur and high performance athletes, therapeutic rehabilitation for individuals with chronic conditions, workplace health and safety, comprehensive health care, and research.

Student Affairs

Academic advisors in the Advising Office are available for program consultation during regular office hours. Students are encouraged to become acquainted with the Advising Office and its resources to discuss any aspect of academic programs.

Kinesiology Student Society (KSS) is an undergraduate club responsible for academic and social activities. The main objective is to build spirit and rapport within the Faculty.

Resources

The Faculty of Kinesiology is home to many integrated units designed to provide a complete experience in education, research, and programming. Research in the Faculty is conducted in some of the finest research laboratories, clinical space, and athletic/recreational training facilities found anywhere in the world. Several highly productive research units exist within the Faculty including the Roger Jackson Centre for Health and Wellness Research comprised of the Human Performance Laboratory (HPL) and the Sport Medicine Centre.

The Faculty includes several large non-academic units. These units, integral to the Faculty, contribute to an enriched environment for students, staff, and faculty, and include the University of Calgary athletic teams (the Dinos), Active Living, Community Programs, Outdoor Programs, and the Olympic Oval.

The Kinesiology Complex at the University of Calgary is a multi-faceted facility comprised of over 70,000 square metres of indoor area and over 8 hectares of outdoor activity space. The complex consists of five gymnasia, two dance studios, a 50 metre swimming pool, one wrestling room, two multipurpose studios, one fitness studio, a cycle centre, a gymnastics centre, two indoor climbing walls, a large fitness centre, and indoor 400 metre speed skating rink, an Olympic size hockey rink, a short track speed skating rink, high performance weight room, an indoor 200 metre six lane running track, an indoor 400 metre two lane running track, thirteen squash courts, seven racquetball courts, eight classrooms, four lecture theatres, and multiple meeting and conference rooms. The outdoor activity area is comprised of five natural grass playing fields, four outdoor tennis courts, and a synthetic field hockey pitch.

3. Faculty Regulations

Students in the Faculty of Kinesiology are governed by the academic regulations contained in this section and also in the Academic Regulations section of the Calendar. Certain courses are subject to individual prerequisites.

Students are advised to read and consider carefully all regulations and in cases of doubt as to the precise meaning of any statement or regulation, to consult the office of the Associate Dean (Academic), Faculty of Kinesiology.

3.1 Admissions

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for regulations regarding University admission requirements.

Students are admitted to the Fall Term only.

Deadlines

Please refer to the Prospective Students link at: ucalgary.ca/prospectivestudents/.

Limited Enrolment

Enrolment in the Faculty of Kinesiology is limited by admission quotas. Applicants will be admitted on the basis of academic performance, until the enrolment quota is reached.

Mature Student Admission

Students 21 years of age or older by the commencement of the term to which they are seeking admission who are unable to present complete matriculation may apply for admission under special conditions. Such applicants must present evidence of having successfully completed the high school course requirements or equivalents.

Transfer to BEd

Students who plan to apply for admission to the Bachelor of Education Elementary and Secondary Routes should note the regulations listed in the Werklund School of Education section of this Calendar.

Second Baccalaureate Degree

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to Kinesiology programs leading to a Second Baccalaureate Degree with a Major Field or a Second Baccalaureate Degree program with Honours in a Major Field.

Students must apply to the Admissions Office and meet all deadlines and requirements. For more information regarding admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions.

3.2 Registration

Accuracy of Registration

All students are responsible for the completeness and accuracy of their registration and for arranging their course selections to satisfy graduation requirements.

Course Load

The equivalent of 15 units (five half courses) per academic term represents a normal course load in all Faculty of Kinesiology programs. It should be stressed that extra courses represent substantial burdens and may negatively impact overall performance. Opportunities for accelerated progress exist through courses offered in Spring and Summer Intersession.

Interruption of Program Leading to a Degree

Students who interrupt their degree program in the Faculty of Kinesiology are advised that after an absence of one calendar year (twelve consecutive months) from academic study at the university level, they may be required to comply with any regulations that may have come into effect in regard to their program requirements. Students who do not attend the University of Calgary for two or more years (twenty-four consecutive months or greater) will be required to apply for readmission. Students required to withdraw for academic reasons will not be readmitted.

Transfer Credit from Other Institutions

No more than 60 units (10.0 full-course equivalents) taken at other institutions (or University of Calgary courses which have been applied to a previous University of Calgary degree) and acceptable for transfer of credit may be counted towards the degree. Students must have obtained a grade of at least "D" or its equivalent in courses proposed for transfer of credit. Grades obtained in transfer courses may be used in the computation of grade point averages for graduation purposes at the discretion of the Faculty.

A maximum of 27 units (4.5 full-course equivalents) of Kinesiology Core courses (listed under 4. Program Details) may be transferred from other institutions. The Faculty reserves the right to determine any student's sequence of courses; credit for

a course will not be awarded unless the prerequisite for that course (as listed in the Calendar) has been completed with a minimum grade of "C-".

Students may be authorized to take some of their course work at another university if their registration as a visiting student is acceptable to that university. Requests for such authorization should be made through the Advising Office.

It is the responsibility of the student to provide full details of the courses proposed for transfer at the time of application. It is also the responsibility of the student to ensure that upon completion of the courses an official transcript is forwarded to the Admissions Office of this University in order that the appropriate credit may be officially recorded. Students must obtain a grade of "D" or better for transfer of credit.

Students must request a Letter of Permission, via their Student Centre, prior to registering in courses outside the University of Calgary to ensure courses will transfer.

Duration of Degree

All courses counting towards the degree must be completed within 10 consecutive calendar years from the time of first registration in the Faculty.

Courses Bearing a Prerequisite

A student must obtain a grade of "C-" or better in a prerequisite course to be eligible for the subsequent course.

Withdrawal from Courses

A student may withdraw from any course via the student registration system. The request must be submitted by the deadline as specified in the Academic Schedule. Before withdrawing from any course, a student is strongly recommended to seek advice from the instructor and the Advising Office.

Students wishing to withdraw completely from the University should refer to the Academic Regulations section of this Calendar.

Students will not be permitted to withdraw more than once from a particular course. Students will be required to withdraw from the Faculty if they have accumulated a total of more than 30 units (5.0 full-course equivalent) of withdrawals while in attendance at the University of Calgary.

Repetition of Courses

Students may repeat a course previously failed or one in which a higher grade is sought. However, a student will usually be permitted to repeat a particular course only once. Failure to achieve a minimum grade of "C-" in a required prerequisite course after two attempts will result in immediate required withdrawal from the Faculty, subject to the right of written appeal to the Kinesiology Appeals Committee.

Non-Kinesiology Student Registration

Students not admitted to the Faculty of Kinesiology, who have completed 30 units (5.0 full-course equivalent) of Kinesiology courses (transfer or offered by the Faculty of Kinesiology), will be restricted from registration in additional Kinesiology courses.

3.3 Course Work

Credit in Courses by Special Assessment

Students are referred to B.10.1 in the Academic Regulations section of this Calendar for University regulations on special assessment. Students may not count more than 12 units (2.0 full-course equivalents) towards their degree in courses taken outside the Faculty by special assessment.

3.4 Student Standing

Performance Review, Probationary Status and Dismissal

The academic standing of students registered in the Faculty will be reviewed after each Winter Term provided that they have completed at least 18 units (3.0 full-course equivalents at the University of Calgary since their previous review. (Students who have not completed 18 units (3.0 full-course equivalents since the previous review will retain their existing status until the next subsequent review.) All University of Calgary credit courses, which have been completed since the previous review, are used for the purpose of academic review. Students placed on academic probation or required to withdraw as a result of the academic performance review will be so advised in writing.

Notwithstanding the specific regulations pertaining to Student Standing, students' academic standing may be reviewed at any time and those with generally poor academic records may be placed or continued on academic probation or required to withdraw at the discretion of the Associate Dean, Academic and Student Affairs or other delegate of the Dean.

Failure to achieve a minimum grade of "C-" in a required prerequisite course after two attempts will also result in immediate required withdrawal from the Faculty.

Probation, Dismissal, Readmission

1. Probationary status is only available in Kinesiology, subsequent to a successful appeal of a student's "required to withdraw" status.
2. Probationary status carries the stipulation that a student will:

   a. Retain a GPA of at least 2.00 over all courses taken since the previous review.

   b. Be reinstated in satisfactory standing if they have achieved a GPA of at least 2.00 over all courses taken since their previous review.

   c. Will be required to withdraw from the Faculty if they have achieved a GPA of less than 2.00 over all courses taken since their previous review.
3. Students required to withdraw from the Faculty of Kinesiology for unsatisfactory academic performance must wait a minimum of 12 months from the date of withdrawal to re-apply, at which time they will be considered for admission at the next admission cycle together with new transfer applicants. Re-applicants will be required to meet the transfer admission standards prior to being re-admitted. Students who are readmitted after having been required to withdraw from the Faculty of Kinesiology will be placed on probation for the next term in which they register.
4. Students required to withdraw from an Honours program under conditions of unsatisfactory academic performance will be deemed ineligible for readmission to an Honours program. However, the student may be admitted to a BKin or BSc program.

Dean's List

The Dean's List recognizes the outstanding academic achievement of students in the Faculty of Kinesiology. To be included, a student must achieve a GPA of at least 3.60 over a minimum of 24 units (4.0 full-course equivalents), graded, completed in the preceding Fall and Winter Terms at the University of Calgary. Students on academic sanction are not eligible for the Dean's List.

3.5 Graduation

Degree "With Distinction"

In a non-Honours program a GPA of 3.60 or better over the last 90 units (15.0 full-course equivalents) will result in the degree being awarded with distinction.

A student who has taken part of their course work at another university or who has transferred into the Faculty may be granted a degree with distinction at the discretion of the Faculty.

Degree with First Class Honours

In an Honours program a GPA of 3.60 or better over the last 90 units (15.0 full-course equivalents) will result in the degree being awarded with First Class Honours.

A student who has taken part of their course work at another university or who has transferred into the Faculty may be granted a degree with First Class Honours at the discretion of the Faculty.

Minor Field Programs

Students may formally declare a Minor Field and have this officially recorded on their transcript of record provided they satisfy the requirements for the relevant Minor Field program. This declaration must be made no later than the time of their last registration.

Minor Fields may be taken from Continuing Education and the Faculties of Arts, Science, Cumming School of Medicine, and the Haskayne School of Business.

3.6 Appeals Process

There are no Faculty-specific regulations governing appeals. Please refer to I. Reappraisal of Grades and Non-Disciplinary Academic Appeals in the Academic Regulations section of this Calendar.

3.7 Fees and Expenses

Students will be expected to pay supplementary fees in some courses, as specified

in course registration materials. For registration details visit ucalgary.ca/registrar/.

4. Program Details

4.1 Requirements

Bachelor of Kinesiology and Bachelor of Science Programs

1. Attainment a minimum 2.00 grade point average over the entire program, as outlined below.

2. Attainment a minimum 2.00 grade point average in all Faculty of Kinesiology courses.

3. No more than the equivalent of 12 units (2.0 full-course equivalents) "D" or "D+" grades in core course requirements.

4. No more than the equivalent of 24 units (4.0 full-course equivalents) "D" or "D+" grades throughout the entire program.

5. No "F" grades will be acceptable towards the BKin or BSc degree. A course normally may be repeated only once.

6. A maximum of 60 units (10.0 full-course equivalents) junior level courses may be applied to any Kinesiology degree.

Kinesiology Core Courses

Within the 120 units (20.0 full-course equivalents) Bachelor of Kinesiology or Bachelor of Science degree, all students must complete the following core courses (54 units (9.0 full-course equivalents)).

- Kinesiology 201
- Kinesiology 203
- Kinesiology 213
- Kinesiology 237
- Kinesiology 244
- Kinesiology 251
- Kinesiology 253
- Kinesiology 259
- Kinesiology 260
- Kinesiology 263
- Kinesiology 323
- Kinesiology 344
- One of Kinesiology 351, 397, or 399
- Kinesiology 355
- Kinesiology 363
- Kinesiology 372
- Kinesiology 373
- Statistics 205 or 213

In addition to the core, each Major requires the specific courses outlined in 4.2 Specific Program Requirements.

Students are expected to register for a selected number of 200-level requirements (chosen from Kinesiology 201, 203, 213, 237, 244, 251, 253, 259, 260, and 263) in Year 1, as well as some of the 200-level requirements for their chosen major. Since this entails more than 30 units (5.0 full-course equivalents), students are expected to complete these 200-level courses in their first two years of study and will be able to tailor their registrations to suit individual circumstances.

All students in the Faculty of Kinesiology must complete a minimum of 15 units (2.5 full-course equivalents) from outside the Faculty of Kinesiology. No more than 45 units (7.5 full-course equivalents) from outside the Faculty of Kinesiology may be used toward Kinesiology degree requirements.

Additional Requirements for Bachelor of Science Programs

To meet BSc degree requirements, at least 63 units (10.5 full-course equivalents) of science equivalents must be completed. These include:

- All courses offered by the Faculty of Science and Schulich School of Engineering.
- Courses offered collaboratively by the Faculty of Arts and the Faculty of Science in Earth Science EASC and Environmental Science ENSC.
- Anthropology 201, 311, 404, 413, 435, 451, 505, 523, 552, 553, 571, 589.
- Archaeology 201, 203, 306, 413, 415, 417, 437, 453, 471, 506, 515, 523, 533, 589, 596.
- Geography 211, 231, 305, 307, 313, 333, 339, 357, 391, 392, 393, 403, 411, 413, 415, 417, 433, 437, 439, 457, 503, 519, 531, 533, 537, 567, 599.
- Psychology 312, 407, 411, 469, 471, 473, 475, 477, 478, 479, 491, 497, 521, 531, 591.
- The following Kinesiology courses: Kinesiology 213, 237, 251, 259, 260, 263, 323, 351, 355, 363, 367, 371, 372, 373, 375, 381, 393, 395, 433, 437, 460, 463, 465, 466, 469, 475, 479, 485, 490, 493, 495.

Honours Programs

See 4.2.7 for additional requirements for Honours programs.

4.2 Specific Program Requirements

4.2.1 Bachelor of Kinesiology or Bachelor of Science

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents))

B. Senior Kinesiology Options (21 units (3.5 full-course equivalents))

C. Senior non-Kinesiology Options (6 units (1.0 full-course equivalents))

D. Junior or Senior non-Kinesiology Options (9 units (1.5 full-course equivalents))

E. Open Options (30 units (5.0 full-course equivalents))

4.2.2 Bachelor of Kinesiology (Athletic Therapy)

Admission

Note: Program is currently suspended. No new admissions will be permitted.

Applicants to the Athletic Therapy Major will enter the program at the third year level after successful completion of listed prerequisites, and selection using quantitative criteria. Admission to the Major is limited to ten students each year. Applicants from outside Kinesiology must also meet the admission criteria for admission to the Faculty.

Since 30 units (5.0 full-course equivalents) of this degree are Mount Royal University courses, a maximum of 30 additional units (5.0 full-course equivalents) of transfer credit may be counted towards the degree (see Transfer of Credit from Other Institutions in section 3.2).

The following requirements must be met and will be used as criteria in determining the most suitable candidates for admission and registration in the program:

1. Successful completion of 48 or more units (8.0 full-course equivalents). The last 24 units (4.0 full-course equivalents) must have been completed at the University of Calgary.

2. A minimum GPA of 3.00 over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) (University of Calgary courses and/or transferable courses taken at other institutions). All grades within a term will be included except where the number of courses taken within a term exceeds that required to fulfill (to a maximum of) 30 units (5.0 full-course equivalents), in which case the highest grades will be used.

3. Successful completion of the following required courses, or equivalents:

(a) Kinesiology 203

(b) Kinesiology 259 with a minimum grade of "C+"

(c) Kinesiology 260 with a minimum grade of "C+"

(d) Kinesiology 263

(e) Kinesiology 323 with a minimum grade of "C"

(f) Kinesiology 330

(g) Kinesiology 371 with a minimum grade of "B"

4. Completion of a structured Letter of Intent.

After meeting the above criteria, students will be ranked according to their GPA calculated over their last 30 units (5.0 full-course equivalents).

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents))

B. Athletic Therapy Major Requirements (45 units (7.5 full-course equivalents)):

Athletic Therapy 471

Athletic Therapy 491

Kinesiology 330

Kinesiology 371

Kinesiology 469

Mount Royal University Courses:

Physical Education 3301

Physical Education 3303

Physical Education 3305

Physical Education 3307

Physical Education 3311

Physical Education 3313

Physical Education 3315

Physical Education 3350

Physical Education 3352

Physical Education 3354

C. Options (21 units (3.5 full-course equivalents))

Registration

Once admitted, Emergency Medical Responder certification must be completed prior to the start of Mount Royal University course work. Students will be responsible for obtaining training and certification.

Athletic Therapy 471 will normally be offered at the end of Summer Term and must be completed prior to commencement of the Mount Royal University course work.

Athletic Therapy 491 is taken after Mount Royal University course work is successfully completed. The course begins prior to the start of Fall Term (usually the third week of August).

4.2.3 Bachelor of Science (Biomechanics)

Admission

Students should refer to the Standard Admission requirements listed in the Undergraduate Admissions section of this Calendar. Note that Mathematics 30-1 or Pure Mathematics 30 with a grade of 70 per cent or above and Mathematics 31 are required for admission.

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents))

B. Biomechanics Major Requirements (33 units (5.5 full-course equivalents)):

- Mathematics 275
- Mathematics 277
- Engineering 201
- Engineering 202
- Engineering 311
- Engineering 317
- Engineering 349
- Kinesiology 393
- Kinesiology 395
- Kinesiology 463
- Kinesiology 466
- Mathematics 211

C. Senior Kinesiology option (9 units (1.5 full-course equivalent))

D. Options (24 units (4.0 full-course equivalents))

4.2.4 Bachelor of Science (Exercise and Health Physiology)

Admission

Students should refer to the Standard Admission requirements listed in the Undergraduate Admissions section of this Calendar. Note that Mathematics 30-1 or Pure Mathematics 30 with a grade of 70 per cent or above is required for admission.

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents))

B. Exercise and Health Physiology Major Requirements (33 units (6.0 full-course equivalents)):

- Chemistry 201, 203, 351
- Biochemistry 341
- Mathematics 249 or 265
- Kinesiology 375, 433
- Three of Kinesiology 437, 465, 469, 475, 479, 485, 493, 495
- Kinesiology 441 and one senior Kinesiology option or Kinesiology 490

C. Options (30 units (5.0 full-course equivalents))

4.2.5 Bachelor of Kinesiology (Leadership in Pedagogy and Coaching)

Admission

Admission to the Leadership in Pedagogy and Coaching Major is competitive and space is limited to approximately 30 students.

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents))

B. Leadership in Pedagogy and Coaching Major Requirements (21 units (3.5 full-course equivalents)):

- Kinesiology 311
- Kinesiology 321
- Kinesiology 367
- Kinesiology 391
- Kinesiology 433 or 403
- Kinesiology 491
- Physical Education 321

C. Concentration requirements (Students will declare either the Pedagogy concentration or the Coaching concentration when they enter the Leadership in Pedagogy and Coaching Major).

Pedagogy concentration requirements (15 units (2.5 full-course equivalents)):

- Dance Education 325
- Physical Education 333
- Physical Education 349
- Kinesiology 331
- One of Kinesiology 335, 351*, 371, 375, 381, or 397*, 399*, or 469

**May not be applied to both Core and Senior Option requirements.*

Coaching concentration requirements (18 units (3.0 full-course equivalents)):

- Kinesiology 331
- Kinesiology 371
- Kinesiology 381
- Kinesiology 399*
- Kinesiology 431
- One of Kinesiology 351*, 375, 397*, 437, 469

**May not be applied to both Core and Senior Option requirements.*

D. Options

Pedagogy concentration (30 units (5.0 full-course equivalents))

Coaching concentration (27 units (4.5 full-course equivalents))

4.2.6 Bachelor of Kinesiology or Bachelor of Science (Mind Sciences in Kinesiology)

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents)

B. Mind Sciences in Kinesiology Major Requirements (24 units (4.0 full-course equivalents):

- Psychology 200
- Psychology 201
- Statistics 217
- Six units (1.0 full-course equivalent) from Kinesiology 351, 397, 399
- Three units (0.5 full-course equivalent) from Kinesiology 451, 497, 499
- Six units (1.0 full-course equivalent) from Health and Society 201, 301, 311, Kinesiology 490, 503, 591, 593; Psychology 345, 351, 353, 365, 369, 375, 383; Sociology 201, 321, 341, 407, 409

C. Senior Kinesiology options in addition (12 units (2.0 full-course equivalents))

D. Options (30 units (5.0 full-course equivalents))

Notes:

1. Some of the courses listed above have prerequisites and are restricted to Majors in those programs. It is the student's responsibility to ensure that prerequisites are completed.
2. Kinesiology 451, 497, 499, 503, 591, and 593 must be completed with an instructor associated with the Mind Sciences in Kinesiology Major.
3. Credit in 400-level Psychology courses may be used towards the Mind Sciences in Kinesiology Major. However, access to these courses is extremely limited.

4.2.7 Bachelor of Kinesiology Honours or Bachelor of Science Honours

Honours programs are offered in all majors.

Admission

Applicants to an Honours program must have completed at least 90 units (15.0 full-course equivalents) by the term in which they enter the Honours program. The completed units must include a junior level Statistics course, and a cumulative GPA of at least 3.30 over the 90 units (15.0 full-course equivalents) (with a minimum GPA of 3.30 in all Kinesiology courses). These grade point averages must be maintained in order to retain Honours standing.

Students are strongly encouraged to consult with the Faculty's Advising Office prior to application.

Requirements

Enrolment in Kinesiology 490 (Interpretation of Research and Research Project) is added to the course requirements for each Major in an Honours program. Enrolment in Kinesiology 490 is limited to 20 students. Registration in Kinesiology 490 is contingent on the student having made suitable arrangements with an eligible thesis supervisor, as well as the availability of the resources (laboratory space, equipment, etc.) needed to complete the thesis.

To graduate with Honours, a student will be required to present a minimum GPA of 3.30 over the entire program and an average of at least 3.30 in all courses offered by the Faculty of Kinesiology.

1. To remain in an Honours program a student must maintain a GPA of at least 3.30 in each academic year. The following circumstances will normally result in a student being required to withdraw from the Honours program:

(a) Any "F" grades obtained in the final two years of the program.

(b) The accumulation of more than 12 units (2.0 full-course equivalents) of "D" or "D+" grades throughout the program.

2. Honours students must submit a written report annually to the Associate Dean (Academic) by October 15.

3. Honours students must complete a minimum of 45 units (7.5 full-course equivalents) at the senior level.

4.2.8 Combined BA (Dance)/BKin (Kinesiology)

Introduction

The Faculty of Kinesiology with the Faculty of Arts offers a five-year combined Bachelor of Arts (Dance)/Bachelor of Kinesiology (Kinesiology) degree program. The program requires careful selection of courses to complete all requirements of the two Faculties. Interested students are urged to contact the Advising Offices of the two faculties for advice in choosing their first-year courses.

Admission

Applicants to the combined program must satisfy the admission requirements of both Faculties. Students are strongly advised to enter the combined program directly in first year.

Once accepted to the combined program, students may elect to remain in it or switch to either of the two separate degree programs, as long as the requirements of each Faculty continue to be met. Failure to meet requirements will result in a student being required to withdraw from the combined or separate programs.

Requirements

Students must adhere to the regulations and satisfy the graduation requirements of both Faculties. The combined degree requires at least 150 units (25.0 full-course equivalents) and the successful completion of both degree requirements. A maximum of 60 units (10.0 full-course equivalents) may be at the junior level.

The Faculty of Kinesiology requirements are as follows:

- 54 units (9.0 full-course equivalents) from the Kinesiology Core as listed in 4.1 of the Faculty of Kinesiology section of the Calendar.
- 21 units (3.5 full-course equivalents) of senior Kinesiology options.

Dance requirements are listed in 4.58.3 Combined BA (Dance)/BKin (Kinesiology) of the Faculty of Arts section of this Calendar.

4.2.9 Combined BComm/BKin (Kinesiology) Program

Introduction

The Faculty of Kinesiology with the Haskayne School of Business offers a five-year combined Bachelor of Commerce/Bachelor of Kinesiology (Kinesiology) degree program. The program requires careful selection of courses to complete all requirements of the two Faculties. Interested students are urged to contact the Advising Offices of the two faculties for advice in choosing their first-year courses.

Admission

Applicants to the BComm/BKin program must satisfy the admission requirements of both Faculties. Students are strongly advised to enter the combined program directly in first year. Students may apply for combined degree admission in a subsequent year, upon successful completion of a prescribed set of pre-commerce requirements (see the Haskayne School of Business section of this calendar).

At the point of admission to the combined degree program, students will be administered by the Haskayne School of Business, which is a quota restricted faculty. Therefore, admission and program requirements for the BComm program also apply to students pursuing the combined degree program.

Requirements

Once accepted to the combined program, students may elect to remain in it or switch to either of the two separate degree programs, as long as the requirements of each Faculty continue to be met. Failure to meet requirements will result in a student being required to withdraw from the combined or separate programs.

Students must satisfy the graduation requirements of both Faculties. Program details are listed in the Haskayne School of Business section of this Calendar.

4.2.10 Concurrent BKin (Leadership in Pedagogy and Coaching)/BEd

Introduction

The Faculty of Kinesiology with the Werklund School of Education offers a five-year concurrent Bachelor of Kinesiology (Leadership in Pedagogy and Coaching)/Bachelor of Education in Physical Education. Students are strongly advised to enter the concurrent program directly in first year.

For the requirements for the Werklund School of Education, 4.3 Five-Year Concurrent BEd Program.

Admission

Applicants to the BKin/BEd must meet both the admissions requirements for the Faculty of Kinesiology (Leadership in Pedagogy and Coaching - Pedagogy concentration only) and the Werklund School of Education (see A.2 Undergraduate Admission in this Calendar).

Requirements

A. Kinesiology Core (54 units (9.0 full-course equivalents))

B. Leadership in Pedagogy and Coaching Major Requirements (18 units (3.0 full-course equivalents)):

- Kinesiology 311
- Kinesiology 321
- Kinesiology 367
- Kinesiology 391
- Kinesiology 433 or 403
- Physical Education 321

C. Pedagogy concentration requirements (18 units (3.0 full-course equivalents)):

- Dance Education 325
- Education 201
- Kinesiology 331
- 3 units (0.5 full-course equivalent) English or French literature option
- Physical Education 333
- Physical Education 349

Note: Completion of the BKIN degree is required to be admissible to the final year in Werklund School of Education.

D. 60 units (10.0 full-course equivalents) required by the Werklund School of Education

5. Administration

Faculty Administrative Officers

Dean

P.C. Werthner

Associate Deans

T.E. Gabriele, Academic

P. Wiley, Graduate

C.A. Emery, Research

Faculty of Law

1. Summary of Degree Programs

Degrees Offered

Undergraduate
JD

Graduate
LLM
Post-baccalaureate Certificate

Joint Programs
JD/MBA*
JD/MPP**
International Energy Lawyers Program*** – JD (Calgary)/JD (Houston)

**Combined Degree with the Haskayne School of Business*
***Combined Degree with the School of Public Policy*
****Combined Degree with the University of Houston*

Undergraduate

The JD program comprises three years of full-time study or six years of part-time study, each divided into two sessions of 13 weeks. The program satisfies the National Requirement for the Approved Law Degree established by the Federation of Law Societies.

Combined Degree Programs

The Faculty of Law offers combined degree programs with the Haskayne School of Business (a combined JD/MBA program) the School of Public Policy (a combined JD/MPP program) and the University of Houston (a combined JD/JD program). Students wishing to obtain any of these combined degrees must be admitted to each Faculty through the regular admissions process. Students who have completed their first year of either program may still apply for a combined program by meeting the normal application and admission requirements for the other faculty. Students are generally only admitted to the International Energy Lawyers Program after completing the first year at either the University of Calgary or the University of Houston.

Each combined degree program is a four year program.

Interested applicants should contact the Student Services Officer for additional information.

Graduate

The Faculty of Law offers graduate work leading to both a thesis-based and a course-based LLM degree, as well as a Post-baccalaureate Certificate program. The graduate program focuses on the areas of natural resources, energy and environmental law. For more information see the Faculty of Graduate Studies Calendar.

2. Faculty Information

Contact Information

Location: Murray Fraser Hall Room 2380
Student Information: 403.220.4155
Faculty number: 403.220.7115
Email address: law@ucalgary.ca
Web page URL: law.ucalgary.ca/

Introduction

The Faculty of Law at the University of Calgary officially opened in 1976 with a first year class of 60 students and 9 faculty members. The graduate program at the Faculty was instituted in 1988 with a focus on natural resources, energy and environmental law. Today the Faculty of Law admits 120 students into its JD program annually. The graduate program now consists of a course-based and thesis based LLM program, as well as a Post-baccalaureate Certificate, all of which continue to concentrate on issues and topics related to natural resources, energy and environmental law.

JD Program

Students are admitted into the JD program after successfully completing at least 60 units (10.0 full-course equivalents) in a program of study leading to a degree at a university in Alberta, or its equivalent. Almost every JD student has completed at least one university degree prior to beginning his or her JD studies.

The first year of the JD program is common to all students, and consists of intensive courses in Foundations of Law and Justice (in September and January) as well as courses in Legislation, Constitutional Law, Crime: Law and Procedure, Property, Torts and Contracts.

In the second and third year of the program students complete required courses in Civil Procedure, Administrative Law, Ethical Lawyering, Evidence, Negotiation and Advocacy. They will also take one course within the areas of international law and theoretical perspectives on the law, and fulfill an upper year writing requirement. Students choose the remainder of their courses from their area or areas of interest.

Students in joint degree programs will complete all of the required elements of the JD program.

Students at the Faculty have the opportunity to participate in extra-curricular activities related to the study and practice of law including the Student Legal Assistance legal clinic and Pro Bono Students Canada. In addition, many courses at the Faculty incorporate performance-based learning or have a clinical component.

Courses at the Faculty cover the breadth of the substance and process of law, but also reflect the Faculty's specialties in natural resources, energy and environmental law, and legal practice.

Table of Contents

The Faculty of Law has identified the following minimum standard of competence for our graduates:

1. Substantive legal knowledge

All law graduates should have developed an understanding of:

- The principles and jurisprudence comprising foundational doctrinal areas of
- law (e.g., torts, contracts, constitutional, property, criminal and
- administrative law)
- The principles underlying common law and equity
- Developed knowledge of the sources of law, including the structure of, and
- relationship between, the branches of government
- The role of legislation in the common law system

2. The context of law

All law graduates should have developed an appreciation of:

- Various perspectives on law, including theoretical, historical and comparative
- perspectives
- The implications of international, multi-disciplinary and technological
- innovations for law and legal practice
- The role of policy and its intersection with law
- The problem of access to justice and the role for lawyers in ameliorating it

3. Legal research

All law graduates should possess the ability to:

- Develop a coherent research strategy
- Identify and assess sources of legal and non-legal information appropriate to
- the particular issue(s) or matters

4. Legal analysis and reasoning

All law graduates should have developed the skills necessary for:

- Developing legal arguments and providing legal opinions, including the
- interpretation and application of statutes and case law
- Identifying, investigating and assessing a problem, both factually and legally
- placing a problem within a broader context as appropriate
- Understanding the relationship between different normative orderings, such
- as the relationship between international and domestic law methods

- Critiquing their own legal reasoning and that of others from substantive,
- normative and procedural perspectives

5. Legal communication

All law graduates should have developed the skills necessary for:

- Counseling and advising, including ascertaining the client's needs, wishes and
- risks, providing options to the client, and helping the client to select the
- appropriate option
- Effective negotiation, advocacy and collaboration
- Clear and accurate communication in a format appropriate to its purpose
- drafting formal documents
- Evaluating communication to assess its effectiveness and impact
- Interpersonal skills, including teamwork and collaboration

6. Dispute resolution skills

All law graduates should have:

- Familiarity with drafting and transactional skills relevant to the prevention of
- disputes
- Knowledge of the characteristics and procedures of available forms of
- dispute resolution
- The understanding necessary to recommend appropriate form(s) of dispute
- resolution, whether consensus or adjudicative, for particular settings and
- specific conflicts

7. Ethics

All law graduates should have developed a critical understanding of:

- The normative foundations of the lawyer's role
- The scope and limits of the lawyer's role
- The law governing lawyers and legal practice
- The capacity to identify and resolve ethical dilemmas

Opportunities

To practice law in Canada a lawyer must be a member of a provincial law society, in Alberta the Law Society of Alberta. The JD program at the University of Calgary is approved as a law degree sufficient for admission to the Canadian common law law societies. The LLM programs at the University of Calgary are not approved as law degrees sufficient for admission to the Canadian common law law societies and do not allow students to satisfy the requirements for law society admission through the National Committee on Accreditation.

Graduates from the University of Calgary Faculty of Law work in a wide variety of settings. Many graduates work in legal practice assisting individuals, corporations, organizations and government with their legal needs. Faculty of Law graduates also work, however, in diverse professional, business and creative endeavours, including as legislators, judges, executives, entrepreneurs and academics.

The Faculty of Law at the University of Calgary works with all of our graduates to help them secure employment subsequent to graduation. Information on the Faculty's Career and Development Office can be found here: law.ucalgary.ca/lawcareers.

Student Affairs

The Society of Law Students is the official student association recognized by the Faculty of Law to represent the interests of all students in the undergraduate law program. The Society is responsible for providing law students with social, sporting, academic, volunteering, and administrative services, as well as being the official liaison between the student body and the Faculty, University and broader legal community.

3. Faculty Regulations

Students in the Faculty of Law are governed by the Faculty Regulations and also by the Academic Regulations section of this Calendar. The Faculty Regulations can be found here: law.ucalgary.ca/files/law/faculty-regulations-june-2015.pdf.

4. Admissions

Please contact the Faculty Admissions Office or visit the Faculty of Law website to obtain the most up to date information.

Requirements

The educational prerequisite for admission to the Faculty of Law is successful completion of 60 units (10.0 full-course equivalents) in a program of studies leading to a degree at a university in Alberta, or its equivalent. Courses to be considered must be completed prior to December 31 in the year in which the application is made. These requirements apply to all applicants including Aboriginal Canadian applicants. As a practical matter, however, successful applicants will have completed at least one university degree.

When selecting the 120 most promising students each year, the Admissions Committee considers a number of factors including: academic record, performance on the Law School Admission Test (LSAT), evidence of maturity, extra-curricular activities, work experience, community involvement, the applicant's personal statement addressing the questions set out in the Faculty's application, and references.

Persons with disabilities who meet the above criteria are encouraged to apply, and once admitted the Faculty will accommodate students in accordance with the University policy.

Prospective applicants are urged to be realistic about their chances for admission. Only a percentage of our more than 1300 applicants are admitted each year. A typical first-year class has an average grade point average of 3.60 (on the University of Calgary system) and an LSAT score above the 80th percentile. The average age of the entering classes has remained around 25 to 28 years of age and actual ages of entering students range from the early 20s to the late 40s.

The Law School Admission Test

All students seeking admission to the Faculty of Law are required to take the Law School Admission Test (LSAT). The test is given in February, June, October and December. However, as it may not be given at every testing centre on each occasion, applicants should check carefully the dates on which the test will be administered at the centre which is most convenient for them.

The last acceptable LSAT score will be the December writing. Only those applicants who have done so will be given consideration. Any applicant who is not able to afford the LSAT fee may apply to the Chair of the Admissions Committee. Prescribed forms for a Fee Waiver are available from the Admissions Office. Proof of the applicant's financial position for the previous three years will be required. The criteria are set out on the Fee Waiver form.

Procedures

The deadline for receipt of fully completed application forms is November 1. This is a firm deadline. There are no exceptions. All supporting documentation must be received by March 1. The Admissions Committee starts reviewing files as soon as they are complete. This includes an LSAT score, certified transcripts from all post-secondary educational institutions attended and any required reference. References should be academic and must not be from personal friends, family friends or family members.

Applications that lack any supporting documentation on March 1 may be rejected. All supporting documentation must come directly from the source and not be sent by the applicant.

Because applicants are admitted on a rolling basis, it is to the applicant's advantage to have a completed file as soon as possible. Each applicant will be notified by letter only, as to whether or not they have been admitted or have had their application deferred for a final decision later in the summer. Successful applicants in all categories (ordinary, part-time, transfer, and letter of permission) will be required to confirm, within a specified time period, their acceptance of an offer by sending a non-refundable $200.00 deposit.

Law Society Admission

While the Faculty of Law may admit students to its JD degree program, the right to practice law as a barrister and solicitor is granted only by the law society of the province concerned. Applicants contemplating practice should consider communicating as soon as possible with the law society of the province in which they intend to practice for all relevant particulars. In particular, applicants may wish to make inquires of the law society with respect to matters that raise issues of good character and reputation. Such matters would include, amongst other things, past criminal convictions, instances of academic misconduct or unresolved bankruptcy declarations.

5. Program Details

Requirements for Graduation

Course Requirements

Students must achieve satisfactory performance (i.e., "C-", or higher, or "CR") in the following courses:

Law 400 Constitutional Law (5 credits)

Law 401 Foundations in Law and Justice I (4 credits)

Law 402 Contracts (5 credits)

Law 403 Legislation (3 credits)

Law 404 Property (5 credits)

Law 405 Foundations in Law and Justice II (4 credits)

Law 406 Torts (5 credits)

Law 410 Crime: Law and Procedure (5 credits)

Law 503 Administrative Law (3 credits)

Law 505 Civil Procedure (3 credits)

Law 507 Evidence (3 credits)

Law 509 Business Associations (3 credits)

Law 510 Ethical Lawyering (3 credits)

Law 513 Negotiation: Selected Topics (4 credits)

Law 611 Advocacy: Selected Topics (4 credits)

Additional Requirements

Students must achieve satisfactory performance (i.e., "C-", or higher, or "CR") in the following courses and must submit a Written Declaration to the Office of the

Associate Dean attesting to their completion of these elements.

- Upper-Year Writing Requirement
- International Requirement
- Theoretical Perspectives Requirement

6. Administration

Faculty Administrative Officers

Dean

I. Holloway

Associate Deans

A. Woolley, Academic

G. Hagen, Research and Graduate Program Director

For course descriptions and details of the transition from the old to the new curriculum, consult the electronic Faculty of Law Calendar: law.ucalgary.ca/.

Faculty of Nursing

1. Summary of Degree Programs

Degrees Offered

Undergraduate
BN
Graduate
Post-Master's Nurse Practitioner Diploma - Acute Care (NP Diploma)
MN (thesis and course-based)
PhD

Undergraduate

Bachelor of Nursing Program

The University of Calgary offers an innovative Bachelor of Nursing degree to prepare students for the opportunities and challenges of a nursing career in a changing health care system. Throughout the program, students are provided with a sound theoretical base and supervised practice experience in a variety of nursing settings. Three BN routes are available: a four-year route for high school students, a two and one-half year route for transfer students and a two-year route for degree holders.

Note: Students enrolled at the Calgary Campus, who wish to transfer to the UC-Qatar Campus or Medicine Hat College, must apply for admission at the desired site. Admission will be based on the student's grade point average and the availability of seats.

Bachelor of Nursing Program at Medicine Hat College Site

The Bachelor of Nursing program at Medicine Hat College is a partnership program offered entirely at the Medicine Hat College site, allowing students in the Medicine Hat area increased access to a baccalaureate program without having to relocate.

Note: Students enrolled at the Medicine Hat College Site, who wish to transfer to the Calgary Campus, must apply to the University of Calgary Bachelor of Nursing Degree Program. Admission will be based on the student's grade point average and the availability of seats.

Bachelor of Nursing Program at University of Calgary Qatar Campus

For more information see: ucalgary.ca/faculties/nursingqatar/.

Note: Students enrolled at the Qatar Campus, who wish to transfer to the Calgary Campus, must apply to the University of Calgary Bachelor of Nursing Degree Program. Admission will be based on case-by-case appraisal of student circumstance as well as the student's grade point average and the availability of seats. Due to the differences in courses and curriculum, transferability may be limited.

Post-Diploma Bachelor of Nursing for Registered Nurses (Qatar Campus Only)

For more information see: ucalgary.ca/faculties/nursingqatar/.

Graduate

See the Faculty of Graduate Studies Calendar.

2. Faculty Information

Contact Information

Location: Professional Faculties 1238

Student Information:

BN programs 403.220.4636

Master's and Doctoral programs 403.220.6241

Faculty number: 403.220.6262

Email addresses:

BN at Medicine Hat College - bnosinfo@ucalgary.ca

All other BN programs - nursing@ucalgary.ca

Master's and Doctoral - nursgrad@ucalgary.ca

Website: nursing.ucalgary.ca/

Introduction

The University of Calgary Faculty of Nursing was established in 1969. Undergraduates of the University of Calgary Baccalaureate Program in Nursing participate in the generation of disciplinary knowledge and are prepared to interpret, integrate and apply relevant knowledge from other fields to their practice, on a continuum of active learning. These Undergraduates have a clearly defined philosophical and conceptual basis for their practice; are prepared to provide a strong voice in inter-professional, collaborative undertakings; and use evidence-informed approaches and diverse ways of knowing to provide compassionate care, in order to sustain and promote healthful environments. They are called on to take leadership roles to promote health for individuals, families, public groups, communities and/or populations who are experiencing health transitions and, as such, work in a variety of settings across health/illness trajectories. Undergraduates of the University of Calgary Baccalaureate program in Nursing strive for excellence in meeting entry-level competencies as outlined by the College and Association of Registered Nurses of Alberta (2006) in five domains: professional responsibility/accountability; knowledge-based practice; ethical practice; service to the public; and self-regulation. They demonstrate professional and ethical decision-making behaviours as outlined in the Canadian Nurses Association Code of Ethics for Registered Nurses (2008).

Career Opportunities

Career opportunities in nursing are many and varied. Staff nurse positions are found in acute care (hospital) settings, extended care, home care, and community/rural settings. Nurses are also employed in occupational health nursing and in various government services such as outpost nursing, penitentiaries, international nursing or the Canadian Armed Forces. Completion of a BN degree allows graduates to write the National Council Licensure Examination (NCLEX)which is a prerequisite for licensure in any province/territory in Canada.

Student Affairs

Undergraduate Nursing Society (UNS)

The UNS is a society consisting of elected representatives from the Nursing student body. UNS serves students by providing faculty-student liaisons, information on current nursing issues, graduation funding, social functions and a support network for Nursing students.

Resources

The Faculty of Nursing is located on the first and second floors of the Professional Faculties Building and the sixth floor of Craigie Hall, both which are on the main campus of the University of Calgary. The Faculty houses a Clinical Simulation Learning Centre which is designed as an interactive environment to advance excellence in Nursing. Within it, the acquisition of knowledge and skills is facilitated through a variety of resources which link nursing education, practice and research.

Nursing is a practice based profession. Nursing practice courses begin in Term 3. Each nursing practice course for Terms 3 through 7 consists of a total of 247 practice

hours or 19 hours per week. In Term 8 the total number of practice hours increases to 378 hours. Nursing practice courses take place in a variety of institutional and community settings, including rural and urban centres, with a variety of client populations. Students are expected to travel, at their own expense, to any nursing practice agency within commuting distance to Calgary. Examples of facilities and agencies utilized by the Faculty of Nursing include: Alberta Children's Hospital, Alexandra Community Health Centre, Calgary Correctional Centre, Calgary Health Services, Claresholm Hospital, Foothills Hospital, Home Care, High River Hospital, Peter Lougheed Centre, Rockyview Hospital, Stoney Tribal Health Centre, Strathmore Public Health Unit, Wood's Homes. Many other community health agencies contribute in a variety of ways to the programs of the Faculty of Nursing. Out-of-region and international placements are arranged on an individual basis.

3. Faculty Regulations

3.1 Admissions

General Requirements

Students wishing to begin a Bachelor of Nursing degree program must meet minimum admission requirements as set out in 4. Program Details. Also see the Undergraduate Admissions section of this Calendar.

Deadlines

September Entry:

Refer to the Prospective Students link at: ucalgary.ca/prospectivestudents/

Transfer Students (January Entry)

September 1 for applications

September 30 for documents

Degree-Holding Students (January Entry)

September 1 for applications

September 30 for documents

Note: Qualifying degree must be completed no later than August 31 prior to the admission date.

BN Program at Medicine Hat College Site

February 1 for applications to the University of Calgary

June 1 for documents

Second Baccalaureate Degree

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to the Bachelor of Nursing (Degree Holder Route). Students who hold a previous bachelor's degree (or equivalent) in nursing, which at the discretion of the University is deemed similar or equivalent, will not be considered for admission.

Students must apply to the Admissions Office and meet all deadlines and requirements. For more information regarding admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions.

Attendance in a Prior Nursing Program

Applicants who have previously been enrolled in a baccalaureate Nursing program at another institution, must submit:

1) a letter which outlines their academic plans and explains their reasons for transferring to the University of Calgary program and,

2) a reference letter from the Dean or Designate of the current/prior Nursing program that the applicant is transferring from, confirming that the applicant is/was in good academic standing and that they are eligible to continue in the program.

A follow-up interview with the Associate Dean may be required as part of the review process. Admission is not automatic; applicants will be considered on an individual basis. In instances where applicants have failed prior nursing courses or have been required to withdraw from a prior nursing program, the letter must also explain why they are now likely to be successful. Refer to Undergraduate Admissions, section A.6 Required to Withdraw Students for more detailed information.

Immunization Requirements

All nursing students are required to complete a series of immunization and diagnostic tests as outlined on the Student Immunization Form. Documented proof of completion must be provided to the Faculty of Nursing prior to commencement of the program.

Throughout the BN program, students are required to ensure that immunizations are current and must provide proof of updates to the Faculty of Nursing. Failure to do so will result in students being removed from practice courses until such time as adequate proof has been provided. Please note requirements may change during the program as determined by Alberta Health Services guidelines.

N-95 Fit Testing

All Nursing students must be fit tested for a N-95 mask prior to commencement of Term 1 (for High School Students) or Term 3 (for Transfer and Degree Holders). Students may be required to wear this mask in the practice setting to help protect against certain communicable diseases. Documented proof of a fit test must be provided to the Faculty of Nursing prior to commencement of the program. Fit testing is only valid for two years; therefore students must present proof of a second fit testing at the time of expiration.

English Language Proficiency

The Nursing profession requires a high level of spoken and written communication skills in order to ensure patient safety. Students who, after admission, show an inadequate command of spoken or written English must improve their proficiency to the Faculty's satisfaction in collaboration with the International Foundations Program. Students may be asked to withdraw from the program if their inadequate command of English interferes with their ability to provide patient care.

Students should also be aware of the English Language Proficiency requirements as outlined in A.11 of the Undergraduate Admissions section of this Calendar.

Skills and Abilities for Becoming a Registered Nurse in Alberta

Nursing students require certain basic skills and abilities to progress through a nursing education program and for initial entry to practice as a Registered Nurse in Alberta. Prospective students are encouraged to review the document " Requisite Skills and Abilities for Becoming a Registered Nurse in Alberta (May 2011) " to identify their fit with the requirements of becoming a registered nurse and/or identify their potential need for accommodation[1] in becoming a member of the nursing profession. Examples following each requisite skill and ability are included in the document in order to provide a snapshot of the nature and kind of activities involved in typical entry-level registered nurse practice.

[1]Accommodation is the process of making alterations (to the point of undue hardship) to the delivery of services so that those services become accessible to more people, including people with disabilities. (Alberta Human Rights Commission)

Academic Accommodation Policy

It is important for students with documented disabilities, who have met the admission criteria, to note that the Academic Accommodation Policy does not require the University to lower or substantially modify standards in order to accommodate students with disabilities. Adaptive technology and/or academic accommodations are available to facilitate learning; however, they do not relieve students of their responsibilities to develop the essential skills and abilities expected of all other students.

Police Information Check

All applicants to the Faculty of Nursing are required to provide a current Police Information Check which includes a Criminal Record Check and a Vulnerable Sector Search. In order to be considered "current", the Police Information Check must be completed during the three months prior to admission, (i.e. June 1-August 31 for Fall admission; October 1-December 31 for Winter admission). The original Police Information Check must be presented, in person, or via the online ePIC system, to a Faculty of Nursing Student Advisor. Without this documentation, admission to the Faculty will be rescinded. Detailed information, including deadlines, is available on the Faculty of Nursing website at: nursing.ucalgary.ca/undergradprogram/security-clearance.

Students who are concerned about the presence of a criminal record should contact the Parole Board of Canada for information on receiving a Canadian Pardon/Record Suspension.

Failure to present a clear Police Information Check may result in admission being denied/rescinded. An internal University appeal

process is available to applicants who are refused admission for this reason.

Subsequent to admission and at any time during the program, a student may be required to produce a current Police Information Check, the results of which could require their withdrawal from the program, in the sole discretion of the University. Students are obligated to inform the Faculty immediately of any change in status of their criminal record.

3.2 Registration

Students should refer to B. Registration of the Academic Regulations section of this Calendar for registration procedures.

Accuracy of Registration

All students are responsible for the completeness and accuracy of their registration and for arranging their course selections to meet all program requirements as detailed in this Calendar.

Interruption of Program Leading to a Degree

Students who interrupt their degree program in the Faculty of Nursing are warned that after an absence of one calendar year from academic study at university level, they may be required to comply with any regulations which may have come into effect in regard to their program and requirements. Students who choose to withdraw for one year will not be required to re-apply for admission. However, they must notify the Faculty of Nursing in advance of their intention to return.

Students who choose to withdraw for more than one year, or students who are required to withdraw for academic reasons must re-apply for admission, and meet all admission requirements including the competitive grade point average.

Students whose program is interrupted due to unforeseen circumstances (e.g. illness, injury, etc.) may not be able to complete the term and may be required to complete all coursework at the next available offering. Each situation will be reviewed on an individual basis by the Associate/Assistant Dean, Undergraduate Programs. [NOTE: Terms 5 and 6 are only offered once per academic year.]

Cardio-Pulmonary Resuscitation Certification

All BN students will be required to submit proof of current CPR Certification (valid for a 12 month period from date of course completion) at the **Health Care Provider Level (HCP)** prior to the commencement of clinical practice courses. Evidence of such certification is to be shown to the practice instructor.

Students will be responsible for obtaining course training and certification.

3.3 Course Work

Course Load

The normal course load is 15 units (2.5 full-course equivalents) per term.

Transfer Credit

Core Nursing courses considered for advanced credit must have been completed within the last five years. There is no time limit on completion of support courses which include non-core Nursing options.

Students must have obtained a minimum grade of "C-" in each Anatomy and Physiology course being presented for transfer credit.

Students should be aware that advanced credits awarded to them are part of the basis on which they have been admitted to the Faculty of Nursing, and therefore are not used in the calculation of grade point averages for promotion purposes.

Prospective students should consult with the Faculty of Nursing if they are planning to take courses as an Open Studies student or through another institution such as Athabasca University.

See 4. Program Details section for specific program regulations.

Course Work at Other Institutions for Transfer of Credit - Visiting Student Status

Students in Year 1 may be authorized to complete some of their program course work at another institution if their registration as a Visiting Student is acceptable to that institution, and if they are in good academic standing in the Faculty of Nursing. Permission for such authorization will be given on a Letter of Permission form and requires the approval of the Faculty of Nursing. A fee of $25.00 will be charged for each Letter of Permission.

On completion of studies, it will be the responsibility of the student to ensure that official transcripts of grades are forwarded directly to a Student Advisor in the Faculty of Nursing so that appropriate credit may be awarded. Students are advised that taking courses at the end of their program may affect their graduation date. Please contact a Faculty of Nursing Student Advisor for more information.

Credit in Courses by Special Assessment

The Faculty of Nursing does not allow credit through special assessment for Core Nursing courses. Faculties offering option courses in Year 1 of the BN Program may allow credit through special assessment. Students are referred to the Undergraduate Admissions section of this Calendar for University regulations on obtaining course credits by special assessment. (See B.10.1).

3.4 Student Standing

General Requirements

Academic performance of students registered in the Faculty of Nursing is assessed at the end of each Fall, Winter and Summer Term.

Students must attain a minimum of "C-" in both Kinesiology 259 and 260 in order to progress to Year 2 of the BN Program.

In order to obtain satisfactory standing in the Faculty of Nursing, students must attain a minimum grade of "C-" in all nursing theory courses and a grade of "CR" (completed requirements) in all practice nursing courses. Students will not be permitted to withdraw from practice nursing courses in order to avoid a failing grade.

Students who receive a "D", "D+" or "F' grade in a nursing theory course will be required to repeat it, along with all corequisite nursing theory and practice courses and must meet with the Associate/Assistant Dean (Undergraduate Programs) to determine a progression plan.

Students who receive a grade of "F" in a nursing practice course will be required to repeat it and the corequisite nursing theory courses. Students will be required to withdraw from the corequisite theory courses at the time of the failure of the nursing practice course and must meet with the Associate/Assistant Dean (Undergraduate Programs) to determine a progression plan.

"F" grades in required nursing practice courses and "D", "D+" and "F" grades in required nursing theory (non-practice) courses must be cleared by repeating those courses before students may progress to any further nursing courses.

Students may repeat a course previously failed or one in which a higher grade is sought. However, students usually will be permitted to repeat a particular course only once. Exceptions to this regulation may be made only in unusual circumstances and at the discretion of the Associate Dean (Undergraduate Programs).

Students will not be permitted to withdraw more than once from a particular course. Students will be required to withdraw from the program if they have accumulated a total of more than 30 units (5.0 full-course equivalent) withdrawals while in attendance at the University of Calgary.

All grades (including original grades in repeated courses) are used in the calculation of grade point averages for purposes of the official University transcript of record and for progression in the Nursing programs as outlined in the sections "Students Previously in Satisfactory Standing" and "Students on Probation."

Policies Relative to Practice Experience

Students are advised to read the general University regulations regarding attendance (see E.3) in the section of this Calendar headed Academic Regulations.

Students may be required to complete practice experience at sites other than the location of their residence. Students' practice experience may also be scheduled at various hours, including evenings, nights and weekends, **Monday through Sunday**. Nursing students are responsible for all travel, parking and accommodation costs related to practice.

Students must demonstrate satisfactory practice performance as delineated in the

behavioural objectives of the course. Participation in all activities that are related to practice courses is mandatory.

Failure to fully participate in practice and tutorial sessions will be reviewed by the faculty members teaching the course. Students are advised that evaluation will be based in large measure on their day-to-day performance.

Students who miss one or more lab/practice days may be at risk of not successfully completing the course. Students may be asked to withdraw from the course and complete the course requirements at a later date or they may be granted a deferral of term work pending availability of resources. If required to withdraw from the practice course, the student may be required to repeat corequisite nursing theory courses. Each situation will be reviewed on an individual basis by the Associate/Assistant Dean, Undergraduate Programs.

Normally, a student will not be permitted to withdraw from a practice course in order to avoid a failing grade in that course.

An instructor may prohibit a student from attending or completing a practice experience if there is evidence that the student has acted in a manner that is detrimental to patient care or that patient safety is at risk. The Associate Dean will be consulted or informed about any such situation or action. A student who wishes to appeal such a decision will follow the appeals process as outlined below under 3.6 Appeals Process.

Students Previously in Satisfactory Standing

Students previously in satisfactory standing:

1. Will retain that standing if they have achieved a grade point average of at least 2.00 at the end of Term 2 and Term 4.

2. Will retain that standing if they have achieved a grade point average of at least 2.50 at the end of Terms 6 and 8 on all courses taken since their previous review.

3. Will be placed on probation for a maximum of one academic year if they have achieved a grade point average of 1.70 to 1.99 at the end of Term 2 and Term 4.

4. Will be placed on probation for a maximum of one academic year if they have achieved a grade point average of 2.00 to 2.49 at the end of Terms 6 and 8 since their last review.

5. Will be placed on probation if they are required to repeat any nursing course, regardless of their grade point average.

6. Will be required to withdraw if they have a grade point average of less than 1.70 at the end of Term 2 and Term 4; or less than 2.00 at the end of Terms 6 and 8 since their last review.

7. Will be allowed academic probationary status only once while registered in the Faculty of Nursing.

Note: Terms 1 and 2 are taken in Year 1; Terms 3 and 4 are taken in Year 2; Terms 5 and 6 in Year 3; and Terms 7 and 8 in Year 4.

Students on Probation

- Will be reinstated in satisfactory standing if they have achieved the required cumulative grade point average over all courses taken since and including those on their previous review.
- Will be required to withdraw if they fail to achieve the required cumulative grade point average over all courses taken since and including those on their previous review.
- Will be required to withdraw if they fail to obtain satisfactory standing in any subsequent nursing course, regardless of cumulative grade point average.

Students placed on probation or required to withdraw will be advised in writing.

Students required to withdraw may not apply for readmission in the twelve-month period following their withdrawal. Written application must then be made to the Dean.

Unsatisfactory Standing

The Faculty Council may refuse permission to a student or prospective student to enter any year of any course, if, in the opinion of the Council, the student shows a lack of general educational attainment. Further, a student whose performance in the practice area, in the classroom, in tests, or in final examinations is unsatisfactory, may at any time be required to withdraw from the Faculty.

The Dean's List recognizes the outstanding academic achievement of all BN students in the Faculty. The Dean's List is compiled at the end of Terms 2, 4, and 6. A statement of inclusion on the Dean's List will be recorded on the student's transcript. To be included on the Dean's List, a student must achieve a grade point average of 3.60 or higher on 15 units (2.5 full-course equivalents) in each of the previous terms and must be in good academic standing. Students on academic sanction are not eligible for the Dean’s List.

3.5 Graduation

Requirements

To be awarded the Bachelor of Nursing degree from the University of Calgary:

Students must maintain a minimum grade point average of 2.00 at the end of Terms 2 and 4 and 2.50 at the end of Terms 6 and 8 as set out in 3.4 Student Standing.

Degrees "With Distinction"

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of all BN students whose grade point average is 3.60 or better in their most recent 60 units (10.0 full-course equivalents) taken through the University of Calgary Faculty of Nursing with no grade less than “C-“. The notation “With Distinction” will not be granted if a student obtains a “D”, “D+” or “F” grade in a Nursing Theory course or an “F” grade in a Nursing Practice course which has been completed during the time period in which the last 60 units (10.0 full-course equivalents) have been taken.

Students who have taken part of their course work at another institution or who have transferred into the Faculty with fewer than 60 units (10.0 full-course equivalents) remaining to be completed for BN requirements may be granted a degree with distinction at the discretion of the Faculty.

3.6 Appeals Process

Reappraisal/Appeals

Appeals initiated by students in the BN and BN at Medicine Hat College Site will be governed by the University's regulations and procedures. Appeals at the Faculty level must be in writing, directed to the Dean and submitted within 15 days of the event or ruling giving rise to the appeal. Any such appeal must specify (a) exactly what is being appealed, (b) grounds for the appeal, and (c) the remedy sought. If sufficient grounds are not specified in the letter of appeal, the Chairperson of the Committee on Appeals may refuse to entertain the appeal.

Also see section I. Reappraisal of Grades and Non-Disciplinary Academic Appeals in the Academic Regulations section of this Calendar.

3.7 Fees and Expenses

Tuition

Please refer to the Tuition and General Fees section of this Calendar for a breakdown of tuition fees. BN students who take courses in Spring/Summer Intersession to complete degree requirements will be assessed standard University tuition fees for these courses.

Other Expenses

In addition to textbooks and course packages, Nursing students can expect other additional charges. Examples listed below:

- Uniforms (as outlined in the Faculty of Nursing Uniform Policy)
- Stethoscope
- Police Information Check
- CPR Certification/Re-certification
- Immunizations
- N-95 Fit Test
- Travel to and from practice sites
- Parking Fees at practice sites
- Name badges
- Nurse Registration Examinations

4. Program Details

4.1 Bachelor of Nursing Program at the University of Calgary

Introduction

The University of Calgary offers an innovative Bachelor of Nursing degree to prepare students for the opportunities and challenges of a nursing career in a changing health care system. Throughout the program, students are provided with a sound theoretical base and supervised practice experience in a variety of nursing settings.

Admission to the Program

See admission regulations in the Undergraduate Admissions section of this Calendar.

Direct Entry Route (from High School):

To be eligible for the Direct Entry Route, applicants must be entering directly from high school or be presenting no more than 12 units (2.0 full-course equivalent) transferable post-secondary courses (including University of Calgary courses).

(a) Standard (high school) Admission: English Language Arts 30-1, Pure Mathematics 30 or Mathematics 30-1 or Mathematics 30-2, Biology 30, Chemistry 30 and one other "30" level 5-credit subject.

(b) Adult Student Admission: English Language Arts 30-1, Pure Mathematics 30 or Mathematics 30-1 or Mathematics 30-2, Biology 30 and Chemistry 30. The fifth 5-credit subject is waived.

(c) Transfer students must present the required matriculation subjects as outlined in (a) or (b) above. A transfer average will be calculated and used as outlined in this Calendar A.2.

Transfer Route:

Applicants must present the following high school subjects or equivalent:

- Mathematics 30-1 or 30-2
- Biology 30
- Chemistry 30

Plus the following from an accredited post-secondary institution recognized by the University of Calgary:

- A minimum of 30 transferable units (5.0 full-course equivalents) which must include the following courses, or equivalent, at a junior level or higher:
  - English or a comparable English literature (3 units or 0.5 full-course equivalent
  - Arts* course (3 units or 0.5 full-course equivalent)
  - Statistics course (3 units or 0.5 full-course equivalent)
  - Approved** human Anatomy and Physiology course(s) (6 units or 1.0 full-course equivalent) with a minimum of grade of "C-").
- A transfer grade point average (GPA) which meets the minimum admission average (set annually). Effective Fall Term 2017, the Transfer Admission GPA will be calculated based on the five prerequisites outlined above (English, Arts, Statistics and Anatomy/Physiology), regardless of when they were completed, plus an additional 15 units (2.5 full-course equivalents) taken from the most recent transferable coursework for a total of 30 units (5.0 full-course equivalents) and as per section A.2 (Undergraduate Admission).

**Arts includes any course offered by the Faculty of Arts at the University of Calgary.*

***Approved by the Faculty of Nursing.*

Degree holders will only be admitted to the Transfer Route as space permits.

Nursing Program Routes Table

	Direct Entry Students	Transfer Students - September Entry	Transfer Students - January Entry	Degree-Holders January Entry
Fall	Term 1	Term 3		
Winter	Term 2	Term 4	Term 3	Term 3
Spring/Summer			Term 4	Term 4
Fall	Term 3	Term 5	Term 5	Term 5
Winter	Term 4	Term 6	Term 6	Term 6
Spring/Summer		Term 7		Term 7
Fall	Term 5	Term 8	Term 7	Term 8
Winter	Term 6		Term 8	
Spring/Summer				
Fall	Term 7			
Winter	Term 8			

Nursing Program of Study Table

	Term 3	Term 4	Term 5	Term 6	Term 7	Term 8
Discipline	NURS 285	NURS 385	NURS 485	NURS 495	NURS 585	
Science	NURS 287	NURS 387	NURS 487	NURS 497	NURS SR. OPTION	
Supporting	NURS 288	NURS 388	NURS 488	NURS 498	NURS SR. OPTION	
Integrating (Practice)	NURS 289	NURS 389	NURS 489	NURS 499	NURS 589	NURS 599

Degree-Holder Route:

Applicants must present the following from an accredited post-secondary institution recognized by the University of Calgary:

- An approved baccalaureate degree.
- A minimum of 90 transferable units (15.0 full-course equivalents) which must include the following courses, or equivalent, at a junior level or higher:
  - English or a comparable English literature course (3 units or 0.5 full-course equivalent)
  - Arts* course (3 units or 0.5 full-course equivalent)
  - Statistics course (3 units or 0.5 full-course equivalent)
  - Approved** human Anatomy and Physiology course (6 units or 1.0 full-course equivalent with a minimum grade of "C-").
- A grade point average (GPA) which meets the minimum admission average (set annually). Effective Fall Term 2017, the Transfer Admission GPA will be calculated based on the prerequisite courses outlined above (English, Arts, Statistics and Anatomy/Physiology), regardless of when they were completed, plus an additional 15 units (2.5 full-course equivalents) taken from the most recent transferable coursework for a total of 30 units (5.0 full-course equivalents) and as per section A.2 (Undergraduate Admission).

**Arts includes any course offered by the Faculty of Arts at the University of Calgary.*

***Approved by the Faculty of Nursing.*

Limitation of Enrolment

Enrolment in the BN program is limited. Applicants will be accepted on the basis of academic standing in high school and/or previous post-secondary education completed.

Course Requirements

Students are required to register according to the following schedule. Terms 1 and 2 (see "Nursing Program of Study" Table) are for students admitted through the High School Route. Those admitted through the Transfer and Degree-holder Routes are exempt from completing this.

Nursing Program Routes

See "Nursing Program Routes Table".

Students in all three routes of the BN Program are required to complete the following program of study.

Nursing Program of Study

See "Nursing Program of Study Table".

Students admitted to the four-year program route must successfully complete all ten Term 1 and Term 2 courses as outlined under "Course Requirements" prior to commencement of Year 2 (Term 3), unless approved by the Associate Dean, Undergraduate Programs.

Terms 1 and 2 consist of the following required courses:

Kinesiology 259

Academic Writing 303

Junior Arts Option (Suggestions: Psychology 200, 203 or Sociology 201)

Kinesiology 260

Junior Statistics Option (Statistics 205 recommended)

Philosophy Option (Philosophy 249, 259, 313 or 347 recommended)

Junior Open Option (Science option recommended)

Junior Open Option

Junior Open Option

Open Option

Other Requirements

Promotion from year to year is by recommendation of the Faculty of Nursing. For the purposes of promotion, Terms 1 and 2 are taken in Year 1; Terms 3 and 4 in Year 2; Terms 5 and 6 in Year 3, and Terms 7 and 8 in Year 4.

The minimum requirement is a grade point average of 2.00 in each of the first two years and 2.50 in each of the last two years. Please refer to 3.4 Student Standing: Students Previously in Satisfactory Standing.

Program Regulations

Duration of Degree Program

Except with special permission of the Dean, the BN degree must be completed within seven calendar years from the date of initial registration in the program.

Transfer Credit

Students transferring from other institutions or faculties within the University are considered on an individual basis. However, students will be required to complete the equivalent of not fewer than ten courses, at least six of which must be Nursing courses taken as a BN student.

Nurse Registration Examinations

In order to be considered eligible to write the National Council Licensure Examination (NCLEX), BN students are required to complete the fourth year program requirements with a minimum 2.50 grade point average.

4.2 Bachelor of Nursing Program at Medicine Hat College Site

Introduction

The Bachelor of Nursing program at Medicine Hat College is a four year partnership program offered entirely at the Medicine Hat College site, allowing students in the Medicine Hat area increased access to a baccalaureate program without having to relocate. This innovative Bachelor of Nursing degree program prepares students for the opportunities and challenges of a nursing career in a changing health care system. Throughout the program, students are provided with a sound theoretical base and supervised practice experience in a variety of nursing settings.

Admissions

Students will apply to enter the program in year one at Medicine Hat College. Upon successful completion of their first two years of the program and upon meeting the University of Calgary Faculty of Nursing admission criteria (minimum 2.00 GPA on the last 30 units or 5.0 full-course equivalents), students apply to enter the University of Calgary as third year students. The remaining courses will be completed as University of Calgary students at Medicine Hat College.

Course Requirements

1st Year

First and Second Years of the program are Medicine Hat College courses.[1]

Terms 1 and 2

Biology 275

Cellular Molecular Microbiology 250

English 252

Interdisciplinary Studies 100

Statistics 333

Biology 277

Junior Arts Option (Suggestions: Psychology 205 or Sociology 201)

Philosophy Option (Philosophy 313 recommended)

Junior Open Option

Junior Open Option

2nd Year

Term 3

Nursing 285

Nursing 287

Nursing 288

Nursing 289

Term 4

Nursing 385

Nursing 387

Nursing 388

Nursing 389

3rd Year

Term 5

Nursing 485

Nursing 487

Nursing 488

Nursing 489

Term 6

Nursing 495

Nursing 497

Nursing 498

Nursing 499

4th Year

Term 7

Nursing 585

Nursing Senior Option

Nursing Senior Option

Nursing 589

Term 8

Nursing 599

[1]First and Second Year course descriptions will not be listed in the University of Calgary Calendar since students must complete them prior to their admission to this institution.

Other Requirements

Promotion from third year to fourth year is by recommendation of the University of Calgary Faculty of Nursing. For purposes of promotion, the academic year is considered to be from September 1 of one year to August 31 of the next. Hence, Spring/Summer grades are calculated with the previous Fall/Winter Term grades. The minimum requirement is a grade point average of 2.50 in each of the third and fourth years.

Program Regulations

Duration of Degree Program

Except with special permission of the Associate Dean (Undergraduate Programs), the BN degree must be completed within seven calendar years from the date of initial registration in the program.

Nurse Registration Examinations

In order to be considered eligible to write the nurse registration examinations, BN students at the Medicine Hat College Site are required to complete the fourth year program requirements with a minimum 2.50 grade point average.

4.3 Bachelor of Nursing (Qatar Campus)

Introduction

The University offers four-year Bachelor of Nursing and two-year post-diploma Bachelor of Nursing degree programs through the Qatar Faculty located in Doha, Qatar. For more information see: ucalgary.ca/pubs/calendar/current/ucq-1.html or qatar.ucalgary.ca/.

5. Administration

Faculty Administrative Officers

Dean

D.M. Tapp

Associate Deans

D.S. Raffin Bouchal, Graduate Programs

K.M. Benzies, Research

C.C. Seneviratne, Undergraduate Practice Education

G.P. McCaffrey, Undergraduate Programs

A. Estefan, Teaching and Learning

Schulich School of Engineering

1. Summary of Degree Programs

Degrees Offered

Undergraduate							
Chemical	**Civil**	**Electrical**	**Energy**	**Geomatics**	**Mechanical**	**Oil & Gas**	**Software**
BSc	BSc	BSc	BSc	BSc	BSc	BSc	BSc
BSc BMEN	BSc BMEN	BSc BMEN		BSc BMEN	BSc BMEN		BSc BMEN
BSc ENEE	BSc ENEE	BSc ENEE		BSc ENEE	BSc ENEE		
BSc(Eng)/BSc*	BSc(Eng)/BSc*	BSc(Eng)/BSc*		BSc(Eng)/BSc*	BSc(Eng)/BSc*	BSc(Eng)/BSc*	BSc(Eng)/BSc*
BSc(Eng)/BA*	BSc(Eng)/BA*	BSc(Eng)/BA*		BSc(Eng)/BA*	BSc(Eng)/BA*	BSc(Eng)/BA*	BSc(Eng)/BA*
BSc INTE	BSc INTE	BSc INTE	BSc INTE	BSc INTE	BSc INTE	BSc INTE	BSc INTE
Graduate							
MEng	MEng	MEng		MEng	MEng		
MSc	MSc	MSc		MSc	MSc		
PhD	PhD	PhD		PhD	PhD		

**Combined Degree*

Undergraduate

BSc Programs

The Schulich School of Engineering administers regular four year programs leading to the BSc degree in Chemical, Civil, Electrical, Geomatics, Mechanical, Oil & Gas, and Software Engineering and a polytechnic transfer program leading to the BSc in Energy Engineering.

Specialization

The Departments of Chemical and Petroleum Engineering, Civil Engineering, Electrical and Computer Engineering, Geomatics Engineering and Mechanical and Manufacturing Engineering offer a specialization in Biomedical Engineering which can be combined with the regular four year programs leading to the BSc degree in Chemical, Civil, Electrical, Geomatics, Mechanical and Software Engineering.

The Departments of Chemical and Petroleum Engineering, Civil Engineering, Electrical and Computer Engineering, Geomatics Engineering and Mechanical and Manufacturing Engineering offer a specialization in Energy and Environment, which can be combined with the regular four year programs leading to the BSc degree in Chemical, Civil, Electrical, Geomatics, and Mechanical Engineering.

Minors and Concentrations

In addition, the Department of Electrical and Computer Engineering offers an Electrical Engineering degree with a Minor in Computer Engineering, the Department of Chemical and Petroleum Engineering offers a Chemical Engineering degree with a Minor in Petroleum Engineering, the Department of Civil Engineering offers minors in Structural, and in Transportation Engineering, the Department of Geomatics Engineering offers a Geomatics Engineering degree with a Concentration in Cadastral Surveying, the Department of Mechanical and Manufacturing Engineering offers a Mechanical Engineering degree with minors in Mechatronics, Manufacturing Engineering or in Petroleum Engineering (offered in conjunction with the Department of Chemical and Petroleum Engineering). The Schulich School of Engineering in conjunction with the Haskayne School of Business offers a Minor in Entrepreneurship and Enterprise Development.

Engineering Internship Program

The Schulich School of Engineering also provides the option of an Internship Program. The Engineering Internship Program is a five-year program which includes, in addition to the regular four-year academic program, an internship year (a minimum of twelve and a maximum of sixteen consecutive months) of supervised work experience in industry.

While internship is not a requirement for Oil & Gas Engineering, students are strongly encouraged to participate in the internship program.

Combined Programs

Undergraduate engineering students may combine their engineering degree with other undergraduate degrees and/or minors offered at the University of Calgary. Program details are given in the section 4.12 Combined Programs.

Graduate

Graduate work leading to the MSc, MEng and PhD degrees is offered by all engineering departments under the administration of the Faculty of Graduate Studies. Details of these programs appear in the Faculty of Graduate Studies Calendar.

Diplomas

Diplomas of the Schulich School of Engineering, which provide special qualifica-

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tions in designated areas, are also offered. For additional details see the section 4.13 Diplomas.

Diploma of the Schulich School of Engineering

The Schulich School of Engineering sponsors a diploma program providing additional special qualifications in designated departments which lead to the Diploma of the Schulich School of Engineering. This program is intended primarily for professional engineers engaged in practice who are not interested in submitting to the discipline of a true graduate degree including a thesis.

The Schulich School of Engineering also sponsors a diploma program providing additional specialization in Environmental Engineering. This diploma is intended for professional engineers or holders of equivalent approved degrees and leads to the Diploma of the Schulich School of Engineering in Environmental Engineering.

Diploma of the Schulich School of Engineering and the Haskayne School of Business in Project Management Specialization

The Schulich School of Engineering and the Haskayne School of Business jointly sponsor a diploma program providing additional special qualifications in the area of Project Management which leads to the Diploma of the Schulich School of Engineering and of the Haskayne School of Business in Project Management. This program is intended primarily for professionals engaged in practice who are not interested in the MSc or MEng degrees.

2. Faculty Information

Contact Information

Engineering Student Centre

Location: Science B 149

Student Information: 403.220.5732

Website: schulich.ucalgary.ca/

Introduction

The Schulich School of Engineering at the University of Calgary was established in 1965. The degrees awarded by the Schulich School since its inception have been recognized by the Canadian Engineering Accreditation Board (CEAB). The engineering curriculum consists of a well-balanced mixture of traditional topics in engineering sciences and specialization in subjects relevant to current industrial practice. The academic staff and students of the Schulich School of Engineering come from all parts of the world, giving the Schulich School its uniquely friendly and international atmosphere.

Enquiries

Enquiries regarding admission, registration, interpretation of regulations, or any matter regarding undergraduate studies in Engineering should be directed to the Engineering Student Centre, Science B 149, telephone 403.220.5732. Students and prospective students are invited to view pertinent information available through the engineering website, schulich.ucalgary.ca/.

Pattern

Admission to the Schulich School of Engineering normally takes one of two forms: (1) Students are admitted to the first year of the program directly from high school; (2) Students are admitted to the first year or second year of the program after having received advanced credits from another University of Calgary faculty or from another post-secondary institution.

The first year of the Engineering program is common to all students. In April of the first year of study, students apply for admission to a discipline: Chemical, Civil, Electrical, Geomatics, Mechanical, Oil & Gas, or Software Engineering. Admission to the discipline is based on the grade point average (GPA) and the courses taken during the first Review Period. During second year, students not only complete courses common for all disciplines, but also courses specific to their chosen discipline. In the third year students take specialized courses in their chosen discipline.

At the end of third year students at their option may enrol in the Engineering Internship Program (EIP); this program consists of 12 to 16 months of work in an industry setting where students gain valuable practical engineering experience (see 4.14 Engineering Internship Program). This academic program is available to all students who have completed third year and are in good standing.

In some disciplines during the fourth year of study (fifth year for Internship enrollees) students have the option to take a minor in one of several areas. In addition to the technical requirements, students take complementary studies courses in non-Engineering and non-Science subjects as an integral component of an Engineering education. This pattern is somewhat different for students who enrol in a combined degree program with one of the other faculties of the University of Calgary (see 4.12 Combined Programs).

Opportunities

To practice in Canada as a professional engineer (P.Eng.) one must be registered (licensed) with the professional engineering association of the province or territory in which one practices. All BSc degrees offered by the Schulich School of Engineering are accredited by the Canadian Engineering Accreditation Board (CEAB) of Engineers Canada, a federation of the 12 professional engineering associations in Canada which registers and licenses engineers. Students graduating from these programs fulfill the academic requirements for registration as Professional Engineers with the province or territory where they choose to practice.

Student Affairs

Engineering Students' Society (ESS)

The Engineering Students' Society (ESS) is an organization affiliated with the Association of Professional Engineers and Geoscientists of Alberta. The ESS provides a social atmosphere for engineering students and, in addition, acquaints them with the professional and technical responsibilities of the profession. It is expected that all Engineering students will join the Society, participate in its activities and promote its interests.

By majority vote of the engineering-student population, in 1995 the Engineering Students' Society established the Calgary Engineering Endowment. A $25.00 per term optional levy is included in the tuition of every engineering undergraduate student. Interest from the endowment is used to purchase equipment for the undergraduate laboratories. The funds are distributed by the Endowment Board of Directors whose membership consists of a majority of undergraduate students. Proposals are requested in March of each year.

3. School Regulations

Students in the Schulich School of Engineering are governed by the academic regulations contained in this section and also in the Academic Regulations section of this Calendar. Students are advised to read and consider all regulations and, in cases of doubt as to precise meaning of any statement or regulation, to consult the Engineering Student Centre, Schulich School of Engineering, Science B 149.

3.1 Admissions

Admission Requirements

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for regulations regarding University admission. Students wishing to enrol in the Schulich School of Engineering must meet minimum admission requirements for Standard Admission as set out in the Undergraduate Admissions section of this Calendar.

Students who have completed most of their high school work two or more years prior to the time of application should contact the Engineering Student Centre.

Students required to withdraw from another faculty or another post-secondary educational institution because of an unsatisfactory academic record will not normally be considered for admission to the Schulich School of Engineering within 12 months of the withdrawal. Students seeking admission or readmission to the Schulich School of Engineering who have been determined (through due process) to be guilty of academic or non-academic misconduct at this or any other academic institution must accompany their application with a letter of explanation and will be considered for admission on an individual basis. Students who have been expelled from the Schulich School of Engineering may not apply for readmission.

Students coming directly from high school must present English Language Arts 30-1, Pure Mathematics 30, Mathematics 31, Physics 30 and Chemistry 30 as specified in the Undergraduate Admissions section of this Calendar. They must apply for admission by the deadline indicated in the Applications for Admission Schedule and submit transcripts to the Registrar's Office as soon

as final grades become available and, in any case, not later than August 1. Students who have never taken Mathematics 31 and present another matriculation subject (e.g., Biology 30, Social Studies 30) instead of Mathematics 31 and who achieve a high standing (at least five per cent above the admission standard) over the five subjects used for admission purposes may be admitted to the School under special conditions. These conditions involve enrolment in an alternative calculus stream.

Students who have attended a post-secondary institution must apply for admission by the appropriate deadline and submit all transcripts to the Registrar's Office as soon as possible but not later than June 30. All applicants must present senior matriculation standing, or equivalent, in the five specified high school subjects, even though they may have attended a post-secondary institution.

Applicants who have a CEAB-accredited engineering degree may be considered for admission to a subsequent engineering degree at the University of Calgary if the degree program requested is determined by the Associate Dean (Student Affairs) to be sufficiently different from the prior degree program. A minimum of 30 units (5.0 full-course equivalents) is required for completion of a University degree. Students admitted under this regulation may, depending on how much transfer credit they are granted, have the Minimum Residence Time regulation waived.

Aboriginal Applicants

The Schulich School of Engineering is committed to enhanced access for aboriginal applicants. In accordance with the University Aboriginal Admission Policy, spaces have been set aside for aboriginal applicants seeking to enter first year from high school or seeking to enter first or second year as a transfer or change-of-faculty student. Students should contact the Associate Dean (Student Affairs) for more information.

Student Athletes

The Schulich School of Engineering encourages applications from student athletes. The school maintains a program that allows Varsity and National team students in first year to balance their academic workload with athletic responsibilities.

Admission to Engineering Program

Choice of an engineering program (Chemical, Civil, Electrical, Geomatics, Mechanical, Oil & Gas, or Software) is normally made during April of the first year of studies. Students in the BSc in Energy Engineering are admitted directly into their program, and as a result, do not choose a program in April of their first year of studies. While a place in at least one of the programs is assured for every student advancing to second year with satisfactory performance, it is not always possible to accommodate every student's first choice of program. Students will not normally be admitted to a program if they are deficient in more than two courses from the first year program or if they are deficient in any courses which are prerequisites for second year courses in the program of choice.

First year Engineering students wishing to enter the Biomedical Engineering Specialization or the Energy & Environment Specialization must apply for admission to the Biomedical Engineering Specialization program or the Energy & Environment Specialization at the same time the choice of an engineering program is made.

In the event that the number choosing a program exceeds the program quota, students will be admitted to the program in order of academic performance until the enrolment limit is reached. Academic performance is judged on the student's GPA for those courses required for the engineering program and taken during the last review period. Priority is generally given to students who have taken a full course load in their last review period and who have all courses in the first year program complete. The exact policy for prioritization of students is determined by the Associate Dean (Student Affairs) and may be revised from year to year. Students may obtain information on current policy from the Engineering Student Centre.

Students admitted to a program at the second year level include the continuing students who have completed their first year successfully in the School and transfer students. Many transfer-student files are not complete and thus no admission decision has been taken at the time registration starts in the summer. To give transfer students a fair opportunity for admission to their program of first choice, a certain number of places will be allotted to the continuing students and the remaining places will be retained for transfer students. The number of places in the two categories will be decided each year based on an assessment of the demand, with the objective of admitting transfer and continuing students to each program with equivalent qualifications. Transfer students are assessed for program admission on an equivalent basis to continuing students in terms of (a) the courses for which they have obtained transfer credit towards the engineering technical program, and (b) their GPA on those courses. Continuing students who have not registered in both Fall and Winter Term classes in their programs by July 15 will not be guaranteed their place in their program. Students who have not been admitted to a program will not normally be permitted to register in courses specific to that program, even if there is room in one or more courses specific to a program.

Admission to Minors

Choice of a Minor within an engineering program (e.g., Civil Engineering with a Minor in Structural Engineering) is made during April of the third year or of the internship year, except as noted below for the Department of Chemical and Petroleum Engineering. To be admitted to a minor in the fourth year, a student must have completed third year in the appropriate engineering program and have a GPA of at least 2.00 in the student's last review period. In the event that the number choosing a Minor exceeds the number that can be accommodated, students will be admitted to the Minor in order of academic performance until the enrolment limit is reached. Academic performance means the student's GPA on only those courses taken in their last review period that are required for the engineering program.

Beginning with the class entering first year engineering in the Fall of 2007, students wishing to register in the Petroleum Minor in Chemical Engineering must apply at the end of their first year of studies. For students who have completed their second-year requirements in Chemical Engineering prior to the beginning of the Fall 2008 Term, admission to the Petroleum Minor at the beginning of fourth year, as described in previous editions of this Calendar, will be available in Fall 2009 and 2010. Places are limited and will be allocated based on GPA as described in the above paragraph on admission to Minors in fourth year.

Students wishing to register in the Computer Engineering Minor in Electrical Engineering must apply at the end of their second year of studies.

Admission to the BSc in Energy Engineering Program

The Schulich School of Engineering employs a holistic approach in reviewing students' applications to the BSc in Energy Engineering program. Applicants must have a Diploma in Engineering Technology from a CTAB (Canadian Technology Accreditation Board) accredited engineering technology program with an average[1] of at least a "B+" grade over all courses comprising the engineering technology program[2] to be eligible for admission consideration. However, we may also consider a range of accomplishments and qualifications, including:

- Overall grade point average (GPA) and/or class rank,
- Schulich School of Engineering minimum course requirements[3],
- Academic readiness,
- Work experience,
- Extracurricular activities, including leadership and community service.

Notes:

1. This average is based on the marks/grades received by the applicants in the required courses for their engineering technology program.
2. For students who are in the process of completing their engineering technology diploma, admission will be based on the average calculated for the first three terms of study (Fall/Winter of Year 1 and Fall of Year 2) and will be conditional on successful completion of the student's engineering technology program prior to admission to the BSc in Energy Engineering program.
3. The minimum course requirements for BSc in Energy Engineering applicants are noted in Section A.5.1.2 of the

University Calendar. Individual course requirements may be substituted by equivalent courses taken as part of the applicant's engineering technology diploma.

Detailed application requirements are available in the Online Supplementary Application.

Admission to the International Foundations Program (IFP) Pathways Stream

Applicants to the IFP Pathways stream are subject to the general requirements for admission to the Schulich School of Engineering listed under Admissions Requirements above. In addition, applicants must meet the minimum English Language Proficiency (ELP) scores for the IFP Pathways stream, as shown in A.11 Undergraduate Admissions.

Students admitted to IFP Pathways must complete the IFP Pathways curriculum and cannot submit ELP scores for early exit. The IFP Pathways curriculum is completed over two years, concurrently with the regular Schulich School of Engineering first-year curriculum (see 4.16 International Foundations Program (IFP) Pathways).

Limited Enrolment

Enrolment in the Schulich School of Engineering is limited. Applicants will be accepted on the basis of academic standing in high school and/or previous course work completed. As a consequence of the limitations in enrolment, the following procedures apply. In addition, refer to information given under the heading Admission to Engineering Program.

Readmission after Voluntary Withdrawal

Students who withdrew voluntarily from the Schulich School of Engineering for two consecutive terms (Fall and Winter Terms of one academic year, or Winter Term and the following Fall Term) and who wish to return, must re-apply for admission by the prescribed deadlines and will be considered in competition with all other applicants. Students are encouraged to consult with the Associate Dean (Student Affairs) prior to making a decision concerning voluntary withdrawal.

Transfer of Course Credits

The Schulich School of Engineering may grant transfer credit to students for courses taken in another post-secondary educational program. Students must normally have obtained an acceptable overall academic standing to be eligible for transfer credit. Transfer credit will be considered for courses which are approximately equivalent to courses in the Engineering program and in which grades of "C-" or higher have been obtained. Transfer credit for a course will not be granted unless the student has obtained credit for the prerequisites for that course (as listed in this Calendar). The maximum number of transfer credits for technical courses that will be awarded is 45 units (7.5 full-course equivalents), except that more may be awarded to a student admitted after completing a CEAB-accredited Engineering degree. Transfer credits for third and fourth year technical courses will only be granted if the instructor(s) of the transferring courses hold a P.Eng. or the equivalent in jurisdictions recognized by the CEAB. Credit for Engineering 513 will only be granted when the transferring course is from another CEAB or Accreditation Board for Engineering and Technology accredited program (or the equivalent in jurisdictions recognized by the CEAB).

Credit will not normally be granted for courses taken eight or more years prior to the date of admission to the Schulich School of Engineering.

Minimum Residence Time

To qualify for a degree, a transfer student must successfully complete at least four regular terms of full-time study and a minimum of 60 units (10.0 full-course equivalents) while registered in the Schulich School of Engineering.

Second Baccalaureate Degree

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to programs leading to a Second Baccalaureate Degree with a Major Field or a Second Baccalaureate Degree program with Honours in a Major Field.

Students must apply to the Admissions Office and meet all deadlines and requirements. For more information regarding admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions.

3.2 Registration

Accuracy of Registration

All students are responsible for the completeness and accuracy of their registration and for arranging course selections to satisfy graduation requirements.

Management of Course Registration

The Schulich School of Engineering may prioritize registration in certain courses to ensure that students are able to register in course sections appropriate to their program and that the available capacity is used to best support students' progression through their programs. Students may contact the Engineering Student Centre for clarification of registration management practices and for assistance with registration, as required.

3.3 Course Work

Prerequisites

To register in an undergraduate course delivered by the Schulich School of Engineering, a student must have obtained a grade of at least "C-" or better in each prerequisite course.

This regulation takes effect at the beginning of the Fall 2013 session. Prior to Fall 2013 "D" and "D+" grades were acceptable as prerequisites (except when such grades meant that credit would not be given for the course under Student Standing regulations). If a student obtained a "D" or "D+" in a course in Summer 2013 or earlier (and is not required by Student Standing regulations to repeat the course), the grade in that course will be considered acceptable in courses for which it is a prerequisite.

Equivalent Courses

Approval may be given by the Associate Dean (Student Affairs) or by the relevant Department Head for a student to replace one or more courses in the Engineering program by registering in equivalent courses in other faculties. To receive credit, the student must normally obtain a grade of "C-" or higher.

Final Year Technical Options

A student in the final year of the Engineering undergraduate program, who has a high academic standing, may be permitted to substitute a graduate course(s) for a fourth year departmental course(s) with the approval of the department. The undergraduate grading scheme will apply to this student.

Part-Time Studies

Because space in the School is limited, students are encouraged to complete all required courses for their year of program within each academic year. Students who have not yet been placed in a specific degree program are advised that taking a reduced course load may disadvantage them when they are ranked for placement in programs.

As long as students take at least 9 units (1.5 full-course equivalents) (not including Block Week courses) in each of the Fall and Winter Terms, they will be allowed to continue in Engineering as long as all other requirements for satisfactory standing are met. Students who take two or fewer courses in Fall or Winter without valid reason for doing so may be required to withdraw or may lose their space in their degree program. This applies as well to students who start a term in three or more courses but complete two or fewer due to withdrawals from courses.

Students who wish to take two or fewer courses in a Fall or Winter Term for valid reasons must request permission from the Associate Dean (Student Affairs). Valid reasons include (but are not limited to): inability to take courses due to missing prerequisites; inability to take courses due to not having been placed in a degree program; extraordinary extracurricular activities such as national team athletic training and competition; extenuating circumstances such as serious disability, illness, or family issues.

As many required courses are not offered during the evenings or during the Spring or Summer Intersession, students should anticipate that it will not be possible to complete their degree without a significant time commitment on weekdays during several Fall and Winter Terms.

Note also that there is a regulation under 3.4 Student Standing that students must normally complete all degree requirements within eight calendar years.

Permission to Take Courses for Credit at Another Institution

Normally students are expected to complete their programs through courses taken at the University of Calgary. Students who wish to take a course elsewhere should obtain written permission from the Schulich School of Engineering before registering in the course, to ensure that it is acceptable for credit.

It is the responsibility of the student to ensure that an official transcript of grades is forwarded directly to the Registrar of the University of Calgary in order that the appropriate credit may be officially recorded. To receive transfer credit, a minimum grade of "C-" or equivalent must be obtained in each transfer course. (Under some circumstances students may also receive credit for courses with grades of "D" or "D+"). The grades obtained in such courses are not used in the computation of grade point averages for graduation purposes.

Complementary Studies

The following six complementary studies courses are required for all students* in the School:

(a) Engineering 209 (Economics 209)** - not open to first-year students

(b) Engineering 481 or equivalent

Current approved equivalent courses are as follows:

- Science, Technology and Society (STAS) 327, Science in Society
- Science, Technology and Society (STAS) 343, Canadian Science Policy and Technology Development

(c) Communications Studies 363

(d) Engineering 513, The Role and Responsibilities of the Professional Engineer in Society

(e) Two general complementary studies courses are required for all programs except in the following cases:

- For Chemical Engineering and Oil and Gas Engineering Programs, students are required to take three general complementary studies courses***

General complementary studies courses must be selected from the list of acceptable courses which may be obtained from the Engineering Student Centre and via the following link: schulich.ucalgary.ca/education/current-students/undergraduate/degree-programs-minors-and-specializations/complementary. Students are responsible for ensuring that any prerequisite conditions are satisfied.

Note inclusions to the list of acceptable general complementary courses for specific programs:

- Energy Management 301, which is required in the Energy and Environment Specialization, counts as a general complementary studies course.
- For Geomatics Engineering Programs (except for Geomatics with Energy and Environment Specialization), Business and Environment 395 may be used as a general complementary studies course.***

**The sequence of complementary studies courses for BSc in Energy Engineering students is listed in Section 4.5. Energy Engineering students may not use Economics/ Engineering 209 or Communication Studies 363; these students must take two general complementary studies courses.*

***Students in Chemical Engineering and Oil and Gas Engineering may not use Economics 209 or Engineering 209 as a Complementary Studies course; these students must take three general complementary studies courses. (Exception: Students in Chemical Engineering and Oil and Gas Engineering programs who obtained credit for Economics 209 or Engineering 209 prior to the Fall 2008 term may have that course counted as a general complementary studies course.)*

****Students entering Geomatics engineering programs (except for Geomatics with Energy and Environment Specialization) in Fall 2013 or later may use Business and Environment 395 as a general complementary studies course. Students who entered the same programs in Fall 2012 or earlier may use Business and Environment 395 as a technical elective only if they have already completed two general complementary studies courses by the end of the Summer 2013; otherwise, they must use Business and Environment 395 as a general complementary studies course. Students may not use Business and Environment 395 to satisfy both a general complementary studies course requirement and a technical elective requirement.*

3.4 Academic Performance, Review, and Student Standing

(Note regarding interpretation of GPA specifications: Schulich School of Engineering regulations are based on GPA values that have been rounded to two decimal places, with ties broken to students' advantage. For example, a GPA of exactly 1.995 will be treated as 2.00 for interpretation of the following regulations, while a GPA of exactly 1.994 will be treated as 1.99.)

For normal advancement towards the degree, students must register in courses directly applicable to the degree program in which they are registered and must maintain satisfactory performance in their programs. Students are referred to the general University regulations regarding Unsatisfactory Standing under F. Academic Standing in the Academic Regulations section of this Calendar. Students are advised to read and consider all regulations and, in cases of doubt as to precise meaning of any statement or regulation, to consult the Engineering Student Centre.

The Schulich School of Engineering Undergraduate Studies Committee meets at the end of the Winter Term to review the academic performance of Engineering students. Categories of Student Standing as a result of the review include “Dean’s List”, “Good Standing”, “On Probation”, and “Required to Withdraw”, which will be described in what follows. All students are subject to review, except:

- Students who have been given permission to take a reduced course load (see Part Time Studies in section 3.3) and who have completed fewer than 18 units (3.0 full-course equivalents) since their last review;
- Students who have spent the majority of the time since their previous review in the Engineering Internship Program.

Normally, all courses taken by the student since the previous review (or since admission in the case of the first review) will be included in the evaluation of academic performance; for students on academic probation at the time of review, only those courses taken during the review period that are required for the student's engineering program will be included in the count of courses and in the evaluation of academic performance.

Notwithstanding these regulations, a student's performance may be reviewed at any time by the School and a student may be permitted to continue in program under specific conditions or required to withdraw.

Specific regulations for the Schulich School of Engineering are listed below.

A. Academic Performance and Progress

A.1 Clearing Courses - Students with one or more "F" grades, or course withdrawals “W”, in the courses taken during the period under review shall clear such courses in the following review period. To clear a course on a second attempt, where a "W" constitutes an attempt, a student must achieve a grade of at least "C-" in the course being repeated or in an approved replacement course. Consistent with University regulations, the same course may normally be attempted no more than twice. A student who fails to clear a course after two attempts may be required to withdraw or placed on academic probation.

A.2. Degree Progression - Students must take lower-level courses before proceeding to higher-level courses even if they have the prerequisites for the higher-level courses.

A.3. Timely Completion - A student who, after eight calendar years from initial registration in the Engineering program, has not completed degree requirements, will be denied further registration in Engineering. (The eight years does not include time spent in the Internship Program, if any, or the extra time spent by those students in the combined degree programs.) For a transfer student, the permissible number of years will be prorated according to the number of credits in the program. Students with approved accommodations based on an assessment by Student Accessibility Services may be allowed additional time to complete their program, subject to approval by the Associate Dean (Student Affairs). Clarification may be obtained from the Engineering Student Centre.

B. Review and Student Standing

B.1 Dean’s List

To be included in the Dean's List, a student must achieve a grade point average of 3.60 or higher during the review period, with at least 30 units (10 half-course equivalents) taken over the immediately preceding 12 month period of May 1 to April 30. Students who have completed fewer than 30 units during the 12 month period are eligible for the Dean’s list only if their program of study has been assessed by Student Accessibility Services to be equivalent to full-time studies for a particular student. Students on

academic sanction are not eligible for the Dean's List.

B.2 Good Standing

B.2a. A student who has a grade point average (GPA) of 2.00 or higher on 18 units or more (6.0 or more half-course equivalents) of courses taken during the period under review will be considered to have satisfactory performance and will be placed in Good Standing.

B.2b. A student who has a grade point average (GPA) of 2.00 or higher on fewer than 18 units (6.0 half-course equivalents) of courses taken during the period under review may be considered to have satisfactory performance, subject to recommendation by the Associate Dean (Student Affairs) and/or review of the student's record by the Engineering Undergraduate Studies Committee.

B.3 Probation

B.3a Placement on Probation - A student who has a grade point average of 1.70 or higher, but less than 2.00 in the current review period will be placed on Probation.

B.3b Clearing Probation – In order to clear probation, students must

i. clear all outstanding courses to date, based on their current year of program; and

ii. attain a GPA of 2.00 or greater in the review period.

Students on probation may have further restrictions placed on their registration such as denial of registration in upper-level courses.

B.4 Required to Withdraw (RTW)

Students under review may be Required to Withdraw from the Schulich School or Engineering for the following reasons:

B.4a – failing to clear all first year courses by the end of their second review period; or

B.4b – failing to achieve a grade point average of 2.00 or greater for the period under review after having previously been placed on probation and/or failing to clear other terms of an academic probation. Students are permitted a maximum of one probationary period while registered as undergraduate students at the University of Calgary, unless probationary periods are more than five years apart; or

B.4c – failing to achieve a grade point average of 1.70 in the period under review.

Students that are required to withdraw will not be permitted to register in any course specified as part of the degree requirements in Engineering for a period of 12 months from the date of withdrawal. A student who has been required to withdraw may apply for readmission, to resume study in a Fall Term beginning 12 months or more after the student has been required to withdraw. Students applying for readmission must respect application and transcript deadlines posted by the University of Calgary Admissions Office; these deadlines are typically several months in advance of the beginning of the Fall Term. Readmission is not automatic and will be considered on an individual basis in competition with all other admission applications received. On readmission, students' records will be reviewed to determine credits to be awarded.

Notes:

1. The above regulations are stated in terms of grades in three-unit courses (half-course equivalent). A grade in a six-unit course (full-course equivalent) will be considered to be equivalent to two such grades.

2. The method used to determine the grade point average is described under F. Academic Standing in the Academic Regulations section of this Calendar.

3. Grades obtained in courses in the Spring/Summer Intersessions are not used to alter retroactively the ruling made on a student's performance at the end of the previous review period.

Mitigating Circumstances

Students who would normally be required to withdraw may be placed on academic probation instead if they have experienced serious mitigating circumstances and can demonstrate that they have good prospects for future success. Students who believe that they fall into this category should discuss their situation with an Engineering Student Centre advisor at the earliest possible opportunity and no later than the end of Winter Term.

IFP Pathways Stream

IFP Pathways students are subject to a joint academic review process by the Schulich School of Engineering and the Werklund School of Education. The regulations set out in sections A. and B. above apply to IFP Pathways students. In addition, IFP Pathways participants must achieve a grade of "C" or better in general academic language instruction courses (IFPX), and a "Pass" in adjunct language support classes (IFPE) to continue in their program of studies. Appeals related to IFPE and IFPX courses will be heard by the Werklund School of Education, while other appeals will be heard by the Schulich School of Engineering.

- If an IFP Pathways student fails a course from the regular Schulich School of Engineering first-year curriculum (4.1 First Year Curriculum), the student will be required to retake the course at the next available opportunity. If, at the end of the second IFP Pathways year, a student is deficient in three or more technical courses, the student may be required to complete an additional year in the common first-year program in order to be placed into a second year Engineering program. Students who fail to clear the common first-year curriculum courses within twelve months of completing the two-year IFP Pathways curriculum (three years total) will be required to withdraw. As part of the academic review, the student may be offered or required to repeat the corresponding IFPE adjunct course.
- If an IFP Pathways student fails the final exam in an International Foundations Program (IFPX) discrete course, but has earned a passing grade (cumulative) on all term work, the student may be offered a remedial summative assessment. Otherwise, if a student fails an International Foundations Program (IFPX) discrete course, the IFPX course must be repeated in order to clear the English Language Proficiency requirement. Students failing to clear the IFP Pathways requirements will be required to withdraw.
- If an IFP Pathways student fails the final exam in an International Foundations Program Engineering (IFPE) adjunct course, but has earned a passing grade (cumulative) on all term work, the student may be offered a remedial summative assessment.

3.5 Examinations

Supplemental Examinations

Supplemental examinations provide students with an opportunity to demonstrate competence in a course. The primary goal is to allow students a chance to earn a "C-" grade in the course so they can use the course as a prerequisite. As such, if a student passes a supplemental examination a "C-" grade will be recorded on the student's transcript. If a student fails the supplementary examination, the original grade will stand.

Supplemental examinations are not available for all courses. Availability of supplemental exams is guaranteed only for courses that explicitly indicate on their official course outline that a supplementary examination is possible. Supplemental examinations may be offered in other courses at the discretion of the department offering the course.

Additionally:

- No more than two supplemental examination privileges, in any University of Calgary course, may be granted to a student in one academic year,
- No more than four supplemental examination privileges will be granted to a student over their whole degree program.
- Only one supplemental exam will be allowed per course.

Supplemental examinations will normally be offered at the same time as deferred final examination for that course, during Spring/Summer intersession, or block weeks. Supplemental examinations may be in a different format than the regular final examination but will cover the same course material as the regular final examination. Supplemental examinations are not allowed for deferred examinations.

Supplemental exams do not replace the deferred examination process as outlined in Section G.6 and are a privilege earned by meeting the criteria set out below.

A student is eligible for a supplemental examination if one is offered in a course and the student meets the following requirements:

1. The student is in good academic standing with the last review GPA being greater than 2.0,

2. The student has earned a cumulative grade of "C-" or better on coursework (e.g. laboratories, assignments, midterm examinations, quizzes), and

3. The student achieved the minimum grade for any required term-work components as indicated on the course outline (e.g. requirement to pass the lab component).

A student is not eligible for a supplemental examination if the student:

- Has been previously allowed to write a supplemental examination for the course.
- Earned a grade greater than a "D+" in the course.
- Did not write the final examination in the course.
- Is on academic probation.
- Was assigned a failing grade in the course due to academic misconduct.
- Is a graduate student

Application Process:

1. Students who wish to apply for a supplemental examination should contact the Engineering

Student Centre to confirm eligibility. Students who indicate that they want to write the supplemental examination will be charged a non-refundable fee by Student Enrolment Services.

2. Students who decide not to write the supplementary examination after fees have been assessed will forfeit the supplementary examination fee.

Supplemental Examinations for Graduating Students

At the discretion of the Engineering Undergraduate Studies Committee, supplemental privileges may be granted to fourth-year students. If these privileges are granted, the student will be informed in writing and must then make application to write the examinations prescribed. Supplemental examinations may be granted in Engineering courses required in the final year program to those students who, at the time of the convocation meeting of the Engineering Undergraduate Studies Committee, will be eligible to graduate if one or two "D", "D+" or "F" grades are raised by up to one full grade. A grade of at least "C-" is required to obtain credit for a course through a supplemental examination.

Where courses other than Engineering courses are involved, the successful completion of another approved course may be accepted as clearing the deficiency.

A student may be granted supplemental privileges for graduating students only once and to a maximum of two supplemental examinations in the courses taken since the last review. Supplemental examinations granted during an academic year will normally be written in the following August.

3.6 Graduation

Graduation Requirements

Students are required to obtain credit for the full set of courses listed in the Calendar for any particular program.

For graduation in all branches of Engineering, a student must have an overall grade point average of at least 2.00 with no uncleared "F" grades. The average will be calculated by using the numerical equivalent of the best grade in each course taken. A six unit (full-course equivalent) course will be counted as two three-unit (half-course equivalent) courses for this purpose.

Note: An "F" grade in any technical elective course or complementary studies elective course may be cleared by a passing grade in another acceptable technical elective or complementary studies elective, respectively.

Degrees "With Distinction"

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of students who obtain a grade point average of at least 3.60 over the last 60 units (10.0 full-course equivalents) taken at the University of Calgary, with no more than one "D" or "D+" grade and no failures. The notation "With Distinction" will not be granted if a student obtains an "F" grade in a CR/F course (including Internship) which has been completed during the time period in which the last 60 units (10.0 full-course equivalents) have been taken. For cases in which the last 60 units (10.0 full-course equivalents) must include some, but not all, of a group of courses taken concurrently, the selection will be made in the manner most advantageous to the student. Students who have taken part of their work at another university or who have transferred into this School may be granted a degree "With Distinction" at the discretion of the School.

4. Program Details

4.1 First Year Curriculum

The first year curriculum is common to all programs except Energy Engineering. Courses shown in both terms may be taken in either term.

First Year

Fall	Winter
Mathematics 275 or Applied Mathematics 217	Mathematics 277 or Applied Mathematics 219
Engineering 200	Engineering 202
Engineering 233	Engineering 225
Mathematics 211	Physics 259
Chemistry 209	Engineering 201
Complementary Studies Course (3 units)	

4.2 Chemical Engineering

Admission

Refer to 3.1 Admissions.

Chemical Engineering, Regular Program

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 317
Engineering 311	Chemical Engineering 315
Engineering 319	Chemical Engineering 331
Engineering 349	Chemistry 357
Science Option (3 units)[1]	
Two Complementary Studies Courses (6 units)	
Third Year	
Fall	**Winter**
Chemistry 409	
Chemical Engineering 407	Chemical Engineering 405
Chemical Engineering 401	Chemical Engineering 421
Chemical Engineering 403	Chemical Engineering 423
Chemical Engineering 427	Chemical Engineering 429
Technical Elective Course (3 units)	
Complementary Studies Course (3 units)	
Fourth Year	
Chemical Engineering 501	Chemistry 579
Chemical Engineering 505	Chemical Engineering 531
Chemical Engineering 511	
Chemical Engineering 551	
Engineering 513	
Two Technical Elective Courses (6 units)	
Complementary Studies Course (3 units)	

[1]*The courses that are acceptable for the Science option include Physics 365 or 369, Geology 377, Biology 241 or 243, Chemistry 321 and Mathematics 377. Other courses from the Faculty of Science may be substituted with approval of the student's department and the relevant department in the Faculty of Science.*

Chemical Engineering, Minor in Petroleum Engineering

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 317
Engineering 311	Chemical Engineering 315
Engineering 319	Chemical Engineering 331
Engineering 349	Chemistry 357
Geology 377	Petroleum Engineering 313
Complementary Studies Course (3 units)	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Chemistry 409	Chemical Engineering 405
Chemical Engineering 407	Chemical Engineering 421
Chemical Engineering 401	Chemical Engineering 423
Chemical Engineering 403	Chemical Engineering 429
Chemical Engineering 427	Technical Elective Course (3 units)
Petroleum Engineering 429	Complementary Studies Course (3 units)

Fourth Year	
Fall	**Winter**
Chemical Engineering 501	Chemistry 579
Chemical Engineering 505	Petroleum Engineering 531
Petroleum Engineering 511	
Petroleum Engineering 551	
Engineering 513	
Two Technical Elective Courses (6 units)	
Complementary Studies Course (3 units)	

Chemical Engineering, Biomedical Engineering Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 317
Engineering 311	Chemical Engineering 315
Engineering 319	Chemical Engineering 331
Engineering 349	Chemistry 357
Biomedical Engineering 301	Biomedical Engineering 309
Complementary Studies Course (3 units)	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Chemistry 409	Chemical Engineering 405
Chemical Engineering 407	Chemical Engineering 421
Chemical Engineering 401	Chemical Engineering 423
Chemical Engineering 403	Chemical Engineering 429
Chemical Engineering 427	Biomedical Engineering 401
Complementary Studies Course (3 units)	Complementary Studies Course (3 units)
Fourth Year - Thesis Option	
Fall	**Winter**
Chemical Engineering 501	Chemical Engineering 531
Chemical Engineering 505	
Chemical Engineering 511	
Engineering 513	
Biomedical Engineering 500[1]	
Two Biomedical Engineering Technical Electives (6 units)	
Fourth Year - Project Option	
Fall	**Winter**
Chemical Engineering 501	Chemical Engineering 531
Chemical Engineering 505	
Chemical Engineering 511	
Engineering 513	
Biomedical Engineering 501	
Any two courses from the following: Biomedical Engineering Technical Electives, Chemical and Petroleum Engineering Technical Electives, Chemical Engineering 551 and Chemistry 579 (6 units)	
Two Biomedical Engineering Technical Electives (6 units)	

[1] *Nine units (three half-course equivalents).*

Chemical Engineering, Energy and Environment Specialization

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	
Engineering 311	Engineering 317
Engineering 319	Chemical Engineering 315
Engineering 349	Chemical Engineering 331
Energy and Environment, Engineering 355	Chemistry 357
Chemistry 321	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Chemistry 409	Chemical Engineering 405
Chemical Engineering 407	Chemical Engineering 421
Chemical Engineering 401	Chemical Engineering 423
Chemical Engineering 403	Chemical Engineering 429
Chemical Engineering 427	Energy and Environment Technical Elective course (3 units)
Energy Management 301	Complementary Studies Course (3 units)
Fourth Year	
Fall	**Winter**
Chemical Engineering 501	Chemistry 579
Chemical Engineering 505	
Chemical Engineering 511	Chemical Engineering 531
Chemical Engineering 551	
Science 529	
Engineering 513	
Two Energy and Environment Technical Elective Courses (6 units)	
Complementary Studies Course (3 units)	

Chemical and Petroleum Engineering Approved Technical Electives

Regular Program and Petroleum Engineering Minor

Select 9 units (three half-course equivalents).

Biomedical Engineering 511	Petroleum Engineering 509
Biomedical Engineering 515	Petroleum Engineering 513
Biomedical Engineering 585	Petroleum Engineering 521
Chemical Engineering 503	Petroleum Engineering 523
Chemical Engineering 519	Petroleum Engineering 525
Chemical Engineering 530	
Chemical Engineering 535	Petroleum Engineering 533
Chemical Engineering 537	Petroleum Engineering 543
Chemical Engineering 539	Petroleum Engineering 561
Energy and Environment, Engineering 501	Petroleum Engineering 563
Energy and Environment, Engineering 503	Petroleum Engineering 571
Energy and Environment, Engineering 505	Petroleum Engineering 573
Petroleum Engineering 507	
Engineering 515	

Note: All technical electives may not be offered each year.

4.3 Civil Engineering

Admission

Refer to 3.1 Admissions.

Accelerated Master's Program

Students entering their third year are encouraged to consider the possibility of continuing their education, by enrolling in a master's degree program after completion of their BSc. By taking two or three courses (graduate or undergraduate) during their undergraduate program, which would be additional to their undergraduate degree program requirements, students will position themselves to be able to complete their master's degree in 12 to 16 months after completion of their BSc. Students considering this possibility must consult with the Associate Head, Undergraduate Studies or the Department Head and should review the Faculty of Graduate Studies admission requirements.

Civil Engineering, Regular Program

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 311
Civil Engineering 337	Engineering 317
Engineering 319	Engineering 407
Engineering 349	Mechanical Engineering 341
Physics 365 or 369	
Two Complementary Studies Courses (6 units)	
Third Year	
Fall	**Winter**
Civil Engineering 413	Civil Engineering 402
Civil Engineering 461	Civil Engineering 423
Civil Engineering 471	Civil Engineering 451
Civil Engineering 481	Civil Engineering 473
Geology 471	
Engineering 513	
Complementary Studies Course (3 units)	
Fourth Year	
Fall	**Winter**
Civil Engineering 570 (6 units)1	

Five Civil Engineering Group A Technical Electives (15 units)
Civil Engineering Group A or Group B Technical Elective (3 units)
Two Civil Engineering Group B Technical Electives (6 units)
Complementary Studies Course (3 units)

[1]*Fall and Winter.*

Civil Engineering, Minor in Structural Engineering

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 311
Civil Engineering 337	Engineering 317
Engineering 319	Engineering 407
Engineering 349	Mechanical Engineering 341
Physics 365 or 369	
Two Complementary Studies Courses (6 units)	
Third Year	
Fall	**Winter**
Civil Engineering 413	Civil Engineering 402
Civil Engineering 461	Civil Engineering 423
Civil Engineering 471	Civil Engineering 451
Civil Engineering 481	Civil Engineering 473
Geology 471	
Engineering 513	
Complementary Studies Course (3 units)	
Fourth Year	
Fall	**Winter**
Civil Engineering 570 (6 units)1	
Civil Engineering 523	Civil Engineering 513
Civil Engineering 551	Civil Engineering 557
Structural Engineering Option (3 units)[2]	
Three Civil Engineering Group A or Group B Technical Electives (9 units)	
Complementary Studies Course (3 units)	

[1]*Fall and Winter.*

[2]*One Structural Engineering graduate course or Civil Engineering 595 (special topics in structures). Department approval required.*

Civil Engineering, Minor in Transportation Engineering

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 311
Civil Engineering 337	Engineering 317
Engineering 319	Engineering 407
Engineering 349	Mechanical Engineering 341
Physics 365 or 369	
Two Complementary Studies Courses (6 units)	
Third Year	
Fall	**Winter**
Civil Engineering 413	Civil Engineering 402
Civil Engineering 461	Civil Engineering 423
Civil Engineering 471	Civil Engineering 451
Civil Engineering 481	Civil Engineering 473
Geology 471	
Engineering 513	
Complementary Studies Course (3 units)	
Fourth Year	
Fall	**Winter**
Civil Engineering 570 (6 units)[1]	
Civil Engineering 575	Civil Engineering 502[2]
Four Civil Engineering Group A Technical Electives (12 units)	
Two Civil Engineering Group A or Group B Technical Elective (6 units)	
Complementary Studies Course (3 units)	

[1]*Fall and Winter.*

[2]*One Transportation Engineering graduate course may be substituted for Civil Engineering 502. Department approval required.*

Civil Engineering, Biomedical Engineering Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 311
Civil Engineering 337	Engineering 317
Engineering 319	Engineering 407
Engineering 349	Mechanical Engineering 341
Physics 365 or 369	Biomedical Engineering 309
Biomedical Engineering 301	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Civil Engineering 413	Civil Engineering 402
Civil Engineering 461	Civil Engineering 423
Civil Engineering 471	Civil Engineering 451
Civil Engineering 481	Civil Engineering 473
Geology 471	Biomedical Engineering 401
Engineering 513	
Complementary Studies Course (3 units)	
Fourth Year - Thesis Option	
Fall	**Winter**
Civil Engineering 570 (6 units)[1]	
Three Civil Engineering Group A Technical Electives (9 units)	
Two Biomedical Engineering Technical Electives (6 units)	
Biomedical Engineering 500[2]	
Two Complementary Studies Courses (6 units)	
Fourth Year - Project Option	
Fall	**Winter**
Civil Engineering 570 (6 units)[1]	
Three Civil Engineering Group A Technical Electives (9 units)	
Two Biomedical Engineering Technical Electives (6 units)	
Biomedical Engineering 501	
Two Biomedical Engineering, Civil Engineering Group A, or Civil Engineering Group B Technical Electives (6 units)	
Two Complementary Studies Courses (6 units)	

[1]*Fall and Winter.*

[2]*Nine units (three half-course equivalents).*

Civil Engineering, Energy and Environment Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Engineering 311
Civil Engineering 337	Engineering 317
Engineering 319	Engineering 407
Engineering 349	Mechanical Engineering 341
Physics 365 or 369	Two Complementary Studies Courses (6 units)
Energy and Environment, Engineering 355	
Third Year	
Fall	**Winter**
Civil Engineering 413	Civil Engineering 402
Civil Engineering 461	Civil Engineering 423
Civil Engineering 471	Civil Engineering 451
Civil Engineering 481	Civil Engineering 473
Geology 471	Engineering 513
Energy Management 301	Complementary Studies Course (3 units)
Fourth Year	
Fall	**Winter**
Civil Engineering 570 (6 units)1	
Science 529	
Civil Engineering 581	
Three Energy and Environment Technical Electives (9 units)	
Four Civil Engineering Group A Technical Electives (12 units)	

[1]*Fall and Winter.*

Civil Engineering Approved Technical Electives

Group A

Civil Engineering 513	Civil Engineering 565
Civil Engineering 523	Civil Engineering 575
Civil Engineering 551	Civil Engineering 581

Group B

Civil Engineering 502	Civil Engineering 571
Civil Engineering 504	Civil Engineering 595
Civil Engineering 508	Civil Engineering 597
Civil Engineering 557	

Notes:

1. One of the Group B Technical Elective course requirements may be satisfied by a 500-level or higher-level course from either the Faculty of Science or the Schulich School of Engineering with the approval of the Department Head. The higher-level course can be a 600-level or higher-level course from the Department of Civil Engineering if the student has a GPA higher than 3.00 at the end of third year and with the approval of the Department Head.

2. All technical elective courses have similar workloads even though the hours in the timetable are variable.

3. Optional undergraduate courses and all graduate courses are offered, in any calendar year, at the discretion of the Department of Civil Engineering.

4.4 Electrical Engineering

Admission

Refer to 3.1 Admissions.

Electrical Engineering, Regular Program

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Computer Engineering 369
Electrical Engineering 101[1]	Electrical Engineering 300
Computer Engineering 339	Electrical Engineering 327
Electrical Engineering 353	Electrical Engineering 343
Physics 365	Electrical Engineering 361
Complementary Studies Course (3 units)	
Third Year	
Fall	**Winter**
Electrical Engineering 102[1]	Electrical Engineering 453
Electrical Engineering 419	Electrical Engineering 471
Electrical Engineering 441	Electrical Engineering 476
Electrical Engineering 475	Electrical Engineering 487
Electrical Engineering 400	
Computer Engineering 467	
Electrical Engineering 469	
Complementary Studies Course (3 units)	
Fourth Year	
Fall	**Winter**
Engineering 513	
Electrical Engineering 500 (6 units)[2]	
Six Technical Elective Courses (18 units)	
Two Complementary Studies Courses (6 units)	

[1]*One and one-half units (quarter-course equivalent).*

[2]*Fall and Winter.*

Electrical Engineering, Minor in Computer Engineering

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Computer Engineering 369
Electrical Engineering 101[1]	Electrical Engineering 300
Computer Engineering 339	Electrical Engineering 327
Electrical Engineering 353	Electrical Engineering 343
Physics 365	Electrical Engineering 361
Complementary Studies Course (3 units)	
Third Year	
Fall	**Winter**
Computer Engineering 467	Electrical Engineering 453
Electrical Engineering 419	Electrical Engineering 471
Electrical Engineering 441	Computer Science 319
Electrical Engineering 102[1]	Software Engineering for Engineers 409
Computer Engineering 511	
Electrical Engineering 400	
One of Electrical Engineering 469, 475 or 487	
Complementary Studies Course (3 units)	
Fourth Year	
Fall	**Winter**
	Computer Engineering 501
Engineering 513	
Electrical Engineering 500 (6 units)[2]	
Electrical Engineering 573	
Computer Science 457	
Three Technical Elective Courses (9 units)	
Two Complementary Studies Courses (6 units)	

[1]*One and one-half units (quarter-course equivalent).*

[2]*Fall and Winter.*

Electrical Engineering, Biomedical Engineering Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Computer Engineering 369
Electrical Engineering 101[1]	Electrical Engineering 300
Computer Engineering 339	Electrical Engineering 327
Electrical Engineering 353	Electrical Engineering 343
Physics 365	Electrical Engineering 361
Biomedical Engineering 301	Biomedical Engineering 309
Complementary Studies Course (3 units)	
Third Year	
Fall	**Winter**
Electrical Engineering 102[1]	Electrical Engineering 453
Electrical Engineering 419	Electrical Engineering 471
Electrical Engineering 441	Electrical Engineering 476
Electrical Engineering 475	Electrical Engineering 487
Electrical Engineering 400	Biomedical Engineering 401
Computer Engineering 467	
Electrical Engineering 469	
Complementary Studies Course (3 units)	
Fourth Year - Thesis Option	
Fall	**Winter**
Electrical Engineering 500 (6 units)[2]	
Engineering 513	
Two Biomedical Engineering Technical Electives (6 units)	
Biomedical Engineering 500 (9 units)	
Two Complementary Studies Courses (6 units)	
Fourth Year - Project Option	
Fall	**Winter**
Electrical Engineering 500 (6 units)[2]	
Engineering 513	
Electrical Engineering Technical Elective Course (3 units)	
Two Biomedical Engineering Technical Electives (6 units)	
Biomedical Engineering 501	
Two Biomedical Engineering or Electrical Engineering Technical Electives (6 units)	
Two Complementary Studies Courses (6 units)	

[1]*One and one-half units (quarter-course equivalent).*

[2] *Fall and Winter.*

Electrical Engineering, Energy and Environment Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Computer Engineering 369
Electrical Engineering 101[1]	Electrical Engineering 300
Computer Engineering 339	Electrical Engineering 327
Electrical Engineering 353	Electrical Engineering 343
Physics 365	Electrical Engineering 361
Energy and Environment, Engineering 355	Engineering 311
Complementary Studies Course (3 units)	
Third Year	
Fall	**Winter**
Electrical Engineering 102[1]	Electrical Engineering 453
Electrical Engineering 419	Electrical Engineering 471
Electrical Engineering 441	Electrical Engineering 476
Electrical Engineering 475	Electrical Engineering 487
Energy Management 301	

Electrical Engineering 400	
Computer Engineering 467	
Electrical Engineering 469	
Fourth Year	
Fall	**Winter**
Science 529	
Electrical Engineering 500 (6 units)[2]	
Engineering 513	
Electrical Engineering Technical Elective Course (3 units)	
Four Energy and Environment Technical Electives (12 units)	
Two Complementary Studies Courses (6 units)	

[1]*One and one-half units (quarter-course equivalent).*

[2]*Fall and Winter.*

Electrical Engineering Approved Technical Electives

Regular Program

Select 18 units (six half-course equivalents).

Computer minor students - can choose from this list, but should also see separate section of technical electives for the Computer minor.

Biomedical Engineering 509	Electrical Engineering 565
Biomedical Engineering 515	Electrical Engineering 567
Biomedical Engineering 585	Electrical Engineering 569
Computer Engineering 501	Electrical Engineering 571
Computer Engineering 507	Electrical Engineering 573
Computer Engineering 509	Electrical Engineering 574
Computer Engineering 511	Electrical Engineering 575
Computer Engineering 515	Electrical Engineering 585
Computer Engineering 517	Electrical Engineering 587
Electrical Engineering 489	Electrical Engineering 591
Electrical Engineering 503	Electrical Engineering 592
Electrical Engineering 514	Electrical Engineering 593
Electrical Engineering 519* (Special Topics)	Electrical Engineering 594
Electrical Engineering 525	Electrical Engineering 597
Electrical Engineering 529	Electrical Engineering 599
Electrical Engineering 541	Energy and Environment Engineering 577
Electrical Engineering 559	Software Engineering 409
Electrical Engineering 562	Software Engineering 545
Electrical Engineering 563	
Electrical Engineering 586	

**A maximum of three Electrical Engineering 519 courses can be selected as technical electives.*

Note: Selection of a course not on this list requires department approval.

Minor in Computer Engineering

All technical electives listed in the Regular Program are permitted, as well as the following:

Computer Science 411	Computer Science 471
Computer Science 453	Computer Engineering 505

In addition, the following courses may be taken as technical electives in the Minor in Computer Engineering if not used to meet other degree requirements:

Electrical Engineering 469
Electrical Engineering 475
Electrical Engineering 476
Electrical Engineering 487

Note: All technical elective courses have similar workloads even though the hours in the timetable are variable. One 500-level or higher course from either the Faculty of Science or the Schulich School of Engineering may be approved by the Associate Head or by the Program Director as a technical elective. Optional undergraduate courses and all graduate courses are offered, in any calendar year, at the discretion of the department.

4.5 Energy Engineering

Admission

Refer to 3.1 Admissions.

Energy Engineering, Regular Program

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Spring	**Summer**
Energy Engineering 240	Energy Engineering 340
Energy Engineering 260	Engineering 201
Energy Engineering 200	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Engineering 311	Petroleum Engineering 523
Energy Engineering 480	Energy Engineering 350
Energy Engineering 300	Energy Engineering 400
Energy Engineering 425	Energy Engineering 460
Energy Engineering 360	Mechanical Engineering 471
Science Option[1]	Chemistry 209
Third Year	
Spring	**Summer**
Engineering 319[2]	
Engineering 513[2]	
Fourth Year	
Fall	**Winter**
Engineering 501	Engineering 502
Energy and Environment, Engineering 355	Energy and Environment, Engineering 503
Energy Engineering 560	Energy Engineering 570
Complementary Studies Course (3 units)	Petroleum Engineering 533
Technical Elective Course (3 units)	Engineering 481
Science Option (3 units)[1]	
Technical Elective Course (3 units)	

[1]*The courses that are acceptable for the Science option include Biology 241 or 243, Chemistry 321, Chemistry 357 and Geology 377. Other courses from the Faculty of Science may be substituted with approval of the Energy Engineering program director and the relevant department in the Faculty of Science.*

[2] *Online Course.*

Energy Engineering Approved Technical Electives

Select 6 units (two half-course equivalents).

Energy and Environment, Engineering 575	Petroleum Engineering 521
Mechanical Engineering 421	Petroleum Engineering 525
Mechanical Engineering 505	Petroleum Engineering 561
Mechanical Engineering 521	Petroleum Engineering 563
Mechanical Engineering 583	Petroleum Engineering 571
Mechanical Engineering 599	Petroleum Engineering 573
Petroleum Engineering 507	

Notes:

1. Students wishing to focus their electives in mechanical engineering should choose their technical electives from Mechanical Engineering 421, 521, 583, and 599; students wishing to focus their electives in petroleum engineering should choose their technical electives from Petroleum Engineering 507, 521, 525, 561, 563, 571, and 573.
2. Technical electives in the undergraduate program and all graduate courses are offered, in any academic year, at the discretion of the department.

4.6 Geomatics Engineering

Admission

Refer to 3.1 Admissions.

Geomatics Engineering, Regular Program

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year[5]	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	
Engineering 319	Geomatics Engineering 327
Engineering 349	Geomatics Engineering 343

Geomatics Engineering 333	Geomatics Engineering 351
Physics 369	Geomatics Engineering 361
Two Complementary Studies Courses (6 units)[1]	
Third Year	
Fall	**Winter**
Geomatics Engineering 103[2]	Engineering 407
Geomatics Engineering 419	Geomatics Engineering 423
Geomatics Engineering 421	Geomatics Engineering 431
Geomatics Engineering 435	Geomatics Engineering 455
Geomatics Engineering 443 or Geomatics Engineering 451	Geomatics Engineering 465
Complementary Studies Course (3 units)	
Fourth Year	
Summer	
Geomatics Engineering 501[3]	
Fall	**Winter**
Geomatics Engineering 500 (6 units)[4]	
Engineering 513	
Six Technical Elective Courses (18 units)	
Complementary Studies Course (3 units)	

[1]The complementary studies course Communication Studies 363 is a corequisite for third year course Geomatics Engineering 451 and a prerequisite for 3rd year course Geomatics Engineering 455. Students must complete the course during or before the Fall Term of their third year.

[2]Block Week Course - Will be offered for the last time in Fall 2016. In Fall 2017 the department is planning to replace this course by another course. Any student who has not completed Geomatics Engineering 103 by Fall 2016 will be required to complete the replacement course instead.

[3]Two week field camp normally held prior to the start of the Fall Term.

[4]Fall and Winter.

[5]Students who entered 2nd year Geomatics Engineering in Fall 2015 or earlier must also complete Applied Mathematics 309 or Mathematics 377.

Geomatics Engineering, Biomedical Engineering Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year[6]	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	
Engineering 319	Geomatics Engineering 327
Engineering 349	Geomatics Engineering 343
Geomatics Engineering 333	Geomatics Engineering 351
Physics 369	Geomatics Engineering 361
Biomedical Engineering 301	Biomedical Engineering 309
	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Geomatics Engineering 103[2]	Engineering 407
Geomatics Engineering 419	Geomatics Engineering 423
Geomatics Engineering 421	Geomatics Engineering 431
Geomatics Engineering 435	Geomatics Engineering 455
Geomatics Engineering 451	Geomatics Engineering 465
Complementary Studies Course (3 units)	Biomedical Engineering 401
Fourth Year - Thesis Option	
Summer	
Geomatics Engineering 501[3]	
Fall	**Winter**
Geomatics Engineering 500 (6 units)[4]	
Engineering 513	
Geomatics Engineering Technical Elective Course (3 units)	
Two Biomedical Engineering Technical Electives (6 units)	
Biomedical Engineering 500[5]	
Two Complementary Studies Courses (6 units)	
Fourth Year - Project Option	
Summer	
Geomatics Engineering 501[3]	
Fall	**Winter**
Geomatics Engineering 500 (6 units)[4]	
Engineering 513	
Geomatics Engineering Technical Elective Course (3 units)	
Two Biomedical Engineering Technical Electives (6 units)	
Biomedical Engineering 501	
Two Biomedical Engineering or Geomatics Engineering Technical Electives (6 units)	
Two Complementary Studies Courses (6 units)	

[1]The complementary studies course Communication Studies 363 is a corequisite for third year course Geomatics Engineering 451 and a prerequisite for 3rd year course Geomatics Engineering 455. Students must complete the course during or before the Fall Term of their third year.

[2]Block Week course – Will be offered for the last time in Fall 2016. In Fall 2017 the department is planning to replace this course by another course. Any student who has not completed Geomatics Engineering 103 by Fall 2016 will be required to complete the replacement course instead.

[3]Two week field camp normally held prior to the start of the Fall Term.

[4]Fall and Winter.

[5]Nine units (three half-course equivalents).

[6]Students who entered 2nd year Geomatics Engineering in Fall 2015 or earlier must also complete Applied Mathematics 309 or Mathematics 377.

Geomatics Engineering, Energy and Environment Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year[5]	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	
Engineering 319	Geomatics Engineering 327
Engineering 349	Geomatics Engineering 343
Geomatics Engineering 333	Geomatics Engineering 351
Physics 369	Geomatics Engineering 361
Energy and Environment, Engineering 355	Engineering 311
	Complementary Studies Course (3 units)
Third Year	
Fall	**Winter**
Geomatics Engineering 103[2]	Engineering 407
Geomatics Engineering 419	Geomatics Engineering 423
Geomatics Engineering 421	Geomatics Engineering 431
Geomatics Engineering 435	Geomatics Engineering 455
Geomatics Engineering 451	Geomatics Engineering 465
Energy Management 301	
Fourth Year	
Summer	
Geomatics Engineering 501[3]	
Fall	Winter
Geomatics Engineering 500 (6 units)[4]	
Science 529	
Engineering 513	
Geomatics Engineering Technical Elective Course (3 units)	
Four Energy and Environment Technical Electives (12 units)	
Two Complementary Studies Courses (6 units)	

[1]The complementary studies course Communication Studies 363 is a corequisite for third year course Geomatics Engineering 451 and a prerequisite for 3rd year course Geomatics Engineering 455. Students must complete the course during or before the Fall Term of their third year.

[2]Block Week course - Will be offered for the last time in Fall 2016. In Fall 2017 the department is planning to replace this course by another course. Any student who has not completed Geomatics Engineering 103 by Fall 2016 will be required to complete the replacement course instead.

[3]Two week field camp normally held prior to the start of the Fall Term.

[4]Fall and Winter.

[5]Students who entered 2nd year Geomatics Engineering in Fall 2015 or earlier must also complete Applied Mathematics 309 or Mathematics 377.

Geomatics Engineering Approved Technical Electives

Select 18 units (six half-course equivalents).

Biomedical Engineering 509	Geomatics Engineering 563
Biomedical Engineering 513	Geomatics Engineering 567
Engineering 515	
Geomatics Engineering 531	Geomatics Engineering 573
Geomatics Engineering 545	Geomatics Engineering 579
Geomatics Engineering 551	Geomatics Engineering 581
Geomatics Engineering 559	Geomatics Engineering 583
	Geomatics Engineering 585

Notes:

1. A 400-level or higher technical course from the Faculty of Science or another engineering department may be substituted for a technical elective with permission of the Head of the Department of Geomatics Engineering.

2. Technical electives in the undergraduate program and all graduate courses are offered, in any academic year, at the discretion of the department.

3. Students who complete Geomatics Engineering 443 may request that Geomatics Engineering 451 be taken as a technical elective with permission of the Head of the Department.

Geomatics Engineering, Concentration in Cadastral Surveying

The Concentration in Cadastral Surveying is for students who have in interest in pursuing a career as a professional land surveyor. Students can acquire a Concentration in Cadastral Surveying by successfully completed the following courses:

1. Geomatics Engineering 443: Geodetic and Engineering Surveys
2. Geomatics Engineering 545: Hydrographic Surveying
3. Geomatics Engineering 579: Survey Law and Practice
4. Geomatics Engineering 581: Land Use Planning
5. Business and Environment 395: Business Law for Strategic Decision Makers
6. One of:
   - Geomatics Engineering 451: Design and Implementation of Geospatial Information Systems
   - Geomatics Engineering 531: Advanced Photogrammetric and Ranging Techniques
   - Geomatics Engineering 559: Digital Imaging and Applications

Students who complete a BSc in Geomatics Engineering with a Concentration in Cadastral Surveying are eligible to obtain Certificate of Completion of Academic Requirements for Professional Surveyors from the Canadian Board of Examiners for Professional Surveyors (CBEPS). For more information about CBEPS and professional registration of land surveyors refer to their website: cbeps-cceag.ca.

4.7 Mechanical Engineering

Admission

Refer to 3.1 Admissions.

Mechanical Engineering, Regular Program

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mechanical Engineering 101[1]	Chemistry 357
Mathematics 375 or Applied Mathematics 307	Engineering 311
Engineering 319	Engineering 317
Engineering 349	Engineering 407
Mechanical Engineering 337	Mechanical Engineering 339
Physics 365 or 369	Mechanical Engineering 341
Third Year	
Fall	**Winter**
Mechanical Engineering 421	
Mechanical Engineering 461	
Mechanical Engineering 471	
Mechanical Engineering 473	
Mechanical Engineering 479	
Mechanical Engineering 485	
Mechanical Engineering 493	
Mechanical Engineering 495	
Manufacturing Engineering 417	
Two Complementary Studies Courses (6 units)	
Fourth Year	
Fall	**Winter**
Mechanical Engineering 538 (6 units)[2,3]	
Mechanical Engineering 585	
Mechanical Engineering 599	
Engineering 513	
Four Mechanical Engineering Technical Elective Courses (12 units)	
Two Complementary Studies Courses (6 units)	

[1]Block Week Course.

[2]Fall and Winter.

[3]Students may substitute Engineering 501 and 502 for Mechanical Engineering 538.

Mechanical Engineering, Minor in Manufacturing Engineering

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mechanical Engineering 101[1]	Chemistry 357
Mathematics 375 or Applied Mathematics 307	Engineering 311
Engineering 319	Engineering 317
Engineering 349	Engineering 407
Mechanical Engineering 337	Mechanical Engineering 339
Physics 365 or 369	Mechanical Engineering 341
Third Year	
Fall	**Winter**
Mechanical Engineering 421	
Mechanical Engineering 461	
Mechanical Engineering 471	
Mechanical Engineering 473	
Mechanical Engineering 479	
Mechanical Engineering 485	
Mechanical Engineering 493	
Mechanical Engineering 495	
Manufacturing Engineering 417	
Two Complementary Studies Courses (6 units)	
Fourth Year	
Fall	**Winter**
	Manufacturing Engineering 514
Mechanical Engineering 538 (6 units)[2,3]	
Mechanical Engineering 585	
Mechanical Engineering 599	
Engineering 513	
Three Manufacturing Minor Technical Elective Courses (9 units)	
Two Complementary Studies Courses (6 units)	

[1]Block Week Course.

[2]Fall and Winter.

[3]Students may substitute Engineering 501 and 502 for Mechanical Engineering 538.

Mechanical Engineering, Minor in Mechatronics

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mechanical Engineering 101[1]	Chemistry 357
Mathematics 375 or Applied Mathematics 307	Engineering 311
Engineering 319	Engineering 317
Engineering 349	Engineering 407

Mechanical Engineering 337	Mechanical Engineering 339
Physics 365 or 369	Mechanical Engineering 341
Third Year	
Fall	**Winter**
Mechanical Engineering 421	
Mechanical Engineering 461	
Mechanical Engineering 471	
Mechanical Engineering 473	
Mechanical Engineering 479	
Mechanical Engineering 485	
Mechanical Engineering 493	
Mechanical Engineering 495	
Manufacturing Engineering 417	
Two Complementary Studies Courses (6 units)	
Fourth Year	
Fall	**Winter**
	Manufacturing Engineering 533
Mechanical Engineering 560[2]	
Mechanical Engineering 538 (6 units)[2,3]	
Mechanical Engineering 585	
Mechanical Engineering 599	
Engineering 513	
Two Mechatronics Minor Technical Elective Courses (6 units)	
Two Complementary Studies Courses (6 units)	

[1]Block Week Course.

[2]Fall and Winter.

[3]Students may substitute Engineering 501 and 502 for Mechanical Engineering 538.

Mechanical Engineering, Minor in Petroleum Engineering

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mechanical Engineering 101[1]	Chemistry 357
Mathematics 375 or Applied Mathematics 307	Engineering 311
Engineering 319	Engineering 317
Engineering 349	Engineering 407
Mechanical Engineering 337	Mechanical Engineering 339
Physics 365 or 369	Mechanical Engineering 341
Third Year	
Fall	**Winter**
Mechanical Engineering 421	
Mechanical Engineering 461	
Mechanical Engineering 471	
Mechanical Engineering 473	
Mechanical Engineering 479	
Mechanical Engineering 485	
Mechanical Engineering 493	
Mechanical Engineering 495	
Manufacturing Engineering 417	
Two Complementary Studies Courses (6 units)	
Fourth Year	
Fall	**Winter**
Petroleum Engineering 523	
Mechanical Engineering 538 (6 units)[2,3]	
Mechanical Engineering 585	
Mechanical Engineering 599	
Engineering 513	
Three Petroleum Minor Technical Elective Courses (9 units)	
Two Complementary Studies Courses (6 units)	

[1]Block Week Course.

[2]Fall and Winter.

[3]Students may substitute Engineering 501 and 502 for Mechanical Engineering 538.

Mechanical Engineering, Biomedical Engineering Specialization

Suggested Sequence of Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mechanical Engineering 101[1]	
Mathematics 375 or Applied Mathematics 307	Engineering 311
Engineering 319	Engineering 317
Engineering 349	Engineering 407
Mechanical Engineering 337	Mechanical Engineering 339
Physics 365 or 369	Mechanical Engineering 341
Biomedical Engineering 301	Biomedical Engineering 309
Third Year	
Fall	**Winter**
	Biomedical Engineering 401
Mechanical Engineering 421	
Mechanical Engineering 461	
Mechanical Engineering 471	
Mechanical Engineering 473	
Mechanical Engineering 479	
Mechanical Engineering 485	
Mechanical Engineering 493	
Mechanical Engineering 495	
Manufacturing Engineering 417	
Two Complementary Studies Courses (6 units)	
Fourth Year - Thesis Option	
Fall	**Winter**
Mechanical Engineering 538 (6 units)[2,4]	
Mechanical Engineering 585	
Mechanical Engineering 599	
Engineering 513	
Biomedical Engineering 500[3]	
Two Biomedical Engineering Technical Electives (6 units)	
Two Complementary Studies Courses (6 units)	
Fourth Year - Project Option	
Fall	**Winter**
Mechanical Engineering 538 (6 units)[2]	
Mechanical Engineering 585	
Mechanical Engineering 599	
Engineering 513	
Biomedical Engineering 501	
Two Biomedical Engineering Technical Electives (6 units)	
Two Biomedical Engineering or Mechanical Engineering Technical Electives (6 units)	
Two Complementary Studies Courses (6 units)	

[1]Block Week Course.

[2]Fall and Winter.

[3]Nine units (three half-course equivalents).

[4]Students may substitute Engineering 501 and 502 for Mechanical Engineering 538.

Mechanical Engineering, Energy and Environment Specialization

Suggested Program Courses

Courses shown in both terms may be taken in either term.

Second Year	
Fall	**Winter**
Mechanical Engineering 101[1]	Chemistry 357
Mathematics 375 or Applied Mathematics 307	Engineering 311
Engineering 319	Engineering 317
Engineering 349	Engineering 407
Mechanical Engineering 337	Mechanical Engineering 339
Physics 365 or 369	Mechanical Engineering 341
Energy and Environment, Engineering 355	
Third Year	
Fall	**Winter**
Mechanical Engineering 421	
Mechanical Engineering 461	
Mechanical Engineering 471	
Mechanical Engineering 473	
Mechanical Engineering 479	
Mechanical Engineering 485	
Mechanical Engineering 493	
Mechanical Engineering 495	
Manufacturing Engineering 417	
Energy and Environment Technical Elective (3 units)	
Complementary Studies Course (3 units)	
Energy Management 301	
Fourth Year	
Fall	**Winter**
Mechanical Engineering 538 (6 units)[2,3]	
Mechanical Engineering 585	

Mechanical Engineering 599	
Engineering 513	
Three Energy and Environment Technical Electives (9 units)	
Two Complementary Studies Courses (6 units)	
Science 529	

[1]Block Week Course.

[2]Fall and Winter.

[3]Students may substitute Engineering 501 and 502 for Mechanical Engineering 538.

Mechanical Engineering Approved Technical Electives

Regular Program

Select four half-course equivalents.

Biomedical Engineering 509	Mechanical Engineering 595
Biomedical Engineering 515	Mechanical Engineering 597
Biomedical Engineering 525	Manufacturing Engineering 501
Energy and Environment, Engineering 575	Manufacturing Engineering 503
Mechanical Engineering 505	Manufacturing Engineering 509
Mechanical Engineering 519	Manufacturing Engineering 514
Mechanical Engineering 521	Manufacturing Engineering 517
Mechanical Engineering 523	Manufacturing Engineering 527
Mechanical Engineering 547	Manufacturing Engineering 533
Mechanical Engineering 583	Petroleum Engineering 521
	Petroleum Engineering 555
	Petroleum Engineering 561
	Petroleum Engineering 563
	Petroleum Engineering 565

**Students must obtain permission from the Biomedical Engineering program director to register in Biomedical Engineering technical electives. Registration priority will be given to students in the Biomedical Engineering specialization.*

Minor in Manufacturing Engineering

Select 9 units (three half-course equivalents).

Manufacturing Engineering 501	Manufacturing Engineering 517
Manufacturing Engineering 503	Manufacturing Engineering 527
Mechanical Engineering 505	Manufacturing Engineering 533
Manufacturing Engineering 509	

Minor in Mechatronics

Select 6 units (two half-course equivalents).

Mechanical Engineering 505	Manufacturing Engineering 529
Mechanical Engineering 547	

Minor in Petroleum Engineering

Select 9 units (three half-course equivalents).

Mechanical Engineering 595	Petroleum Engineering 561
Mechanical Engineering 597	Petroleum Engineering 563
Petroleum Engineering 525	Petroleum Engineering 565
Petroleum Engineering 533	Geology 377
Petroleum Engineering 555	

4.8 Oil & Gas Engineering

Admission

Refer to 3.1 Admissions.

Oil and Gas Engineering

Suggested Sequence of Courses

Courses that span two terms can be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Chemistry 357
Engineering 311	Petroleum Engineering 313
Engineering 319	Chemical Engineering 315
Engineering 349	Chemical Engineering 331
Geology 377	Engineering 317
Two Complementary Studies Courses (6 units)	
Third Year	
Fall	**Winter**
Chemical Engineering 401	Petroleum Engineering 423
Chemical Engineering 403	Petroleum Engineering 507
Chemical Engineering 427	Petroleum Engineering 525
Chemical Engineering 407	Petroleum Engineering 533
Petroleum Engineering 429	Complementary Studies Course
Technical Elective Course (3 units)	
Petroleum Engineering 515	
Fourth Year	
Fall	**Winter**
Chemical Engineering 501	Petroleum Engineering 531
Petroleum Engineering 505	Petroleum Engineering 551
Petroleum Engineering 509	
Petroleum Engineering 511	
Petroleum Engineering 543	
Engineering 513	
Technical Elective Course (3 units)	
Complementary Studies Course (3 units)	

Oil and Gas Engineering Approved Technical Electives

Select six units (two half-course equivalents).

Chemistry 579	Petroleum Engineering 519
Chemical Engineering 405	Petroleum Engineering 543
Chemical Engineering 503	Petroleum Engineering 555
Chemical Engineering 530	
Chemical Engineering 537	Petroleum Engineering 561
Energy and Environment, Engineering 501	Petroleum Engineering 563
Energy and Environment, Engineering 503	Petroleum Engineering 571
Energy and Environment, Engineering 505	Petroleum Engineering 573
Engineering 515	

4.9 Software Engineering

Admission

Refer to 3.1 Admissions.

Software Engineering, Regular Program

Suggested Sequence of Courses

Courses that span two terms can be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Computer Science 319
Computer Engineering 339	Computer Engineering 369
Electrical Engineering 353	Electrical Engineering 327
Engineering 319	Software Engineering for Engineers 409
Physics 365 or 369	Mathematics 271
Complementary Studies Course (3 units)	

Third Year	
Fall	**Winter**
Computer Engineering 511	Software Engineering 401
	Software Engineering 403
	Software Engineering 437
	Software Engineering 471
Computer Science 441	
Computer Science 457	
Computer Science 471	
Software Engineering 301	
Two Complementary Studies Courses (6 units)	
Fourth Year	
Fall	**Winter**
Software Engineering 511	Software Engineering 533[1]
Software Engineering 521	
Electrical Engineering 500 (6 units)[2]	
Four Software Engineering Technical Electives (12 units)	
Engineering 513	
Complementary Studies Course (3 units)	

[1]The total number of technical electives in the software engineering degree program is 12 units (four half-course equivalents). Students entering fourth year who have not completed a technical elective in third year must take must take four 3-unit technical electives in fourth year. Student who have completed Computer Engineering 417 and Computer Engineering 491 are not required to take Software Engineering 533, but may elect to take Software Engineering 533 as a technical elective. Students must meet all engineering complementary studies requirements (see Section 3.3).

[2]Fall and Winter.

Software Engineering, Biomedical Engineering Specialization

Suggested Sequence of Courses

Courses that span two terms can be taken in either term.

Second Year	
Fall	**Winter**
Mathematics 375 or Applied Mathematics 307	Computer Science 319
Computer Engineering 339	Computer Engineering 369
Electrical Engineering 353	Electrical Engineering 327
Engineering 319	Software Engineering for Engineers 409
Biomedical Engineering 301	Mathematics 271
Complementary Studies Course (3 units)	Biomedical Engineering 309
Third Year	
Fall	**Winter**
Computer Engineering 511	Software Engineering 401
Physics 365 or 369	Software Engineering 403
	Software Engineering 437
	Software Engineering 471
	Biomedical Engineering 401
Computer Science 441	
Computer Science 471	
Software Engineering 301	
Two Complementary Studies Courses (6 units)	
Fourth Year - Thesis Option	
Fall	**Winter**
Software Engineering 511	Software Engineering 5331
Software Engineering 521	
Electrical Engineering 500 (6 units)[3]	
Biomedical Engineering 500[2]	
Two Biomedical Engineering Technical Electives (6 units)	
Engineering 513	
Complementary Studies Course (3 units)	
Fourth Year - Project Option	
Fall	**Winter**
Software Engineering 511	Software Engineering 533[1]
Software Engineering 521	
Electrical Engineering 500 (6 units)[3]	
Biomedical Engineering 501	
Two Biomedical Engineering Technical Electives (6 units)	
Two Biomedical Engineering or Software Engineering Technical Electives (6 units)	
Engineering 513	
Complementary Studies Course (3 units)	

[1]The total number of technical electives in the software engineering degree program is 12 units (four half-course equivalents). Students entering fourth year who have not completed a technical elective in third year must take four technical electives in fourth year. Students who have completed Computer Engineering 417 and Computer Engineering 491 are not required to take Software Engineering 533, but may elect to take Software Engineering 533 as a technical elective. Students must meet all engineering complementary studies requirements (see Section 3.3).

[2]9 units (three half-course equivalents).

[3]Fall and Winter.

Software Engineering Approved Technical Electives

Select four half-course equivalents.

Biomedical Engineering 509**	Electrical Engineering 591
Biomedical Engineering 515**	Electrical Engineering 599
Biomedical Engineering 585	Software Engineering 501
Computer Science 411	Software Engineering 513
Computer Science 453	Software Engineering 523
Computer Science 457	Software Engineering 541
Computer Engineering 509	Software Engineering for Engineers 519*
Computer Engineering 501	Software Engineering 499
Computer Engineering 515	Software Engineering for Engineers 545
Computer Engineering 517	Electrical Engineering 592
Electrical Engineering 503	Electrical Engineering 594
Electrical Engineering 525	
Electrical Engineering 563	

**A maximum of three Software Engineering for Engineers 519 courses can be selected as technical electives.*

***A maximum of one of Biomedical Engineering 509 or Biomedical Engineering 515 can be selected as technical electives.*

Notes:

1. Selection of a course not on this list requires department approval. Elective courses are offered, in any calendar year, at the discretion of the department.

2. Computer Science 471, Data Base Management Systems, may be used as a technical elective only by students whose program did not include Computer Science 471 as a required course. Students may not take Computer Science 471 as a technical elective if they have already completed Software Engineering for Engineers 519.31.

3. All technical elective courses have similar workloads even though the hours in the timetable are variable. One 500-level or high course from either the Faculty of Science or the Schulich School of Engineering may be approved by the Associate Head or by the Program Director as a technical elective. Optional undergraduate courses and all graduate courses are offered, in any calendar year, at the discretion of the department.

4.10 Biomedical Engineering Specialization

Introduction

The Biomedical Engineering Specialization (BMEN) allows a student to fulfill the requirements for a BSc degree in Chemical, Civil, Electrical, Geomatics, Mechanical or Software Engineering and at the same time complete a program in Biomedical Engineering.

Admission

First year Engineering students wishing to enter the Biomedical Engineering Specialization must apply for admission to the Biomedical Engineering Specialization program at the same time the choice of an engineering program is made.

Requirements

Curriculum requirements for the Biomedical Engineering Specialization are listed with the requirements for each program.

Biomedical Engineering Approved Technical Electives

Biomedical Engineering 509	Biomedical Engineering 585
Biomedical Engineering 511	Chemical Engineering 535
Biomedical Engineering 513	Computer Engineering 509
Biomedical Engineering 515	Electrical Engineering 563
Biomedical Engineering 519	Manufacturing Engineering 529
Biomedical Engineering 525	Mechanical Engineering 523

Note: Not all technical electives may be offered each year. An updated list of available technical electives may be found at ucalgary.ca/bme/undergraduate.

Practicum

All Biomedical Engineering Specialization students are required to complete a bio-

medical engineering practicum via at least one of the following options:

(a) A minimum of four (4) months of industrial work experience in a biomedical engineering-related company (typically co-ordinated through the Engineering Internship Office).

(b) A minimum of four (4) months research placement in biomedical engineering (typically a summer in a BME laboratory).

(c) Successful completion of a 4th year BME thesis (Biomedical Engineering 500).

All internship or research placements must be approved by the Centre for Bioengineering Research and Education.

4.11 Energy and Environment Specialization

Introduction

The Energy and Environment Specialization (ENEE) allows a student to fulfill the requirements for a BSc degree in Chemical, Civil, Electrical, Geomatics, or Mechanical Engineering and at the same time complete a program in Energy and Environment.

Admission

First year Engineering students wishing to enter the Energy and Environment Specialization must apply for admission to the Energy and Environment Specialization program at the same time the choice of an engineering program is made.

Requirements

Curriculum requirements for the Energy and Environment Specialization are listed with the requirements for each program.

Energy and Environment Approved Technical Electives

Civil Engineering 502	Energy and Environment, Engineering 519
Civil Engineering 506	Energy and Environment, Engineering 573
Civil Engineering 508	Energy and Environment, Engineering 575
Civil Engineering 581	Energy and Environment, Engineering 577
Electrical Engineering 562	Geomatics Engineering 551
Electrical Engineering 581	Geomatics Engineering 583
Electrical Engineering 585	Mechanical Engineering 583
Electrical Engineering 587	Mechanical Engineering 593
Electrical Engineering 597	Petroleum Engineering 523
Energy and Environment, Engineering 501	Petroleum Engineering 533
Energy and Environment, Engineering 503	Petroleum Engineering 555
Energy and Environment, Engineering 505	Petroleum Engineering 561

Note: All technical electives may not be offered each year.

4.12 Combined Programs

An engineering undergraduate degree program may be combined with any other undergraduate degree program on campus. Students may either be admitted to two degree programs when they first apply to the University or may seek admission to a second degree program after being admitted to engineering. Students are reminded that all degree programs at the University of Calgary are subject to quotas and it is the student's responsibility to meet the admission requirements for the second degree program. Students should consult the engineering website or inquire at the Engineering Student Centre for more information.

Students who are admitted to two degree programs when they initially apply to the University of Calgary may opt to spread their first year engineering courses over two years and be admitted to an engineering discipline after their second review period. Interested students must see the Associate Dean (Student Affairs) before the add/drop deadline of their first year to initiate this arrangement.

It is possible for students to opt out of a combined degree program after one year and complete either the BSc (Engineering) or the other degree.

Students may also combine their engineering degree with any minor offered by any faculty at the University of Calgary.

4.13 Diplomas

4.13.1 Diploma of the Schulich School of Engineering

Introduction

The Schulich School of Engineering sponsors a diploma program providing additional special qualifications in designated departments which lead to the Diploma of the Schulich School of Engineering. The designated departments offering the diploma program are: Chemical and Petroleum; Civil; Electrical and Computer; and Mechanical and Manufacturing Engineering. This program is intended primarily for professional engineers engaged in practice who are not interested in enrolling in a graduate degree including a thesis, or who are unable to meet the residence requirements of the MSc degree.

Admission

Admission to the diploma program may be granted to holders of an approved degree or its equivalent. Engineers, without a degree, who are registered as Professional Engineers with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, or an equivalent association, may also be eligible for admission to the diploma program.

Requirements

The diploma program consists of 24 units (4.0 full-course equivalents) of which at least 12 units (2.0 full-course equivalents) must be graduate courses in engineering. Courses which normally fall within an undergraduate program in the same area in which the diploma is sought will not be credited toward the diploma.

Regulations

A student must obtain a grade point average of at least 2.50 in the courses taken for credit toward the diploma. The minimum passing grade in courses taken for credit in the diploma program is "C".

Enquiries about the diploma program should be directed to the department in which the diploma is sought.

Environmental Engineering

The Schulich School of Engineering also sponsors a diploma program providing additional specialization in Environmental Engineering, intended for professional engineers or holders of equivalent approved degrees and leading to the Diploma of the Schulich School of Engineering in Environmental Engineering. The admission criteria, requirements and regulations for the diploma are the same as for the Diploma of the Schulich School of Engineering. Enquiries about the specialization in Environmental Engineering should be directed to the Department of Civil Engineering.

4.13.2 Diploma of the Schulich School of Engineering and the Haskayne School of Business in Project Management Specialization

Introduction

The Schulich School of Engineering and the Haskayne School of Business jointly sponsor a diploma program providing additional special qualifications in the area of Project Management which leads to the Diploma of the Schulich School of Engineering and of the Haskayne School of Business in Project Management. This program is intended primarily for professionals engaged in practice who are not interested in the MSc or MEng degrees.

Admission

Admission to the diploma program may be granted to holders of an approved Engineering degree, Engineers without a degree who are registered with APEGA or an equivalent association, and those having equivalent qualifications or experience as determined by the Director of the Project Management specialization.

Criteria for admission to the Diploma with a Specialization in Project Management of the Schulich School of Engineering and the Haskayne School of Business are as follows:

1. An approved Engineering degree

or

registration with APEGA or an equivalent association

or

equivalent qualifications or experience as determined by the Director of the Project Management Specialization;

2. Up to five years of relevant experience in industry as determined by the Director of the Project Management Specialization;

3. Successful completion of up to 12 units (2.0 full-course equivalents) in the Project Management Specialization with a grade point average of at least 2.50, and a minimum passing grade of "C" for all courses.

Requirements

The diploma program consists of 24 units (4.0 full-course equivalents) of which at least 18 units (3.0 full-course equivalents) must be graduate courses in project management. Courses which fall within an undergraduate program in the area of Project Management will not normally be credited toward the diploma.

Regulations

A student must obtain a grade point average of at least 2.50 in the courses taken for credit toward the diploma. The minimum passing grade in courses taken for credit in the diploma program is "C".

Enquiries about the diploma program should be directed to the Director of the Project Management specialization.

4.14 Engineering Internship Program

Introduction

The Engineering Internship Program is a five-year program which includes, in addition to the regular four-year academic program, an internship year (a minimum of twelve and a maximum of sixteen consecutive months) of supervised work experience in industry. The internship year may commence in May or September after the student has completed the first three years of the Engineering program. The student is expected to return to complete the final academic year of the program in September of the following year. In certain circumstances, it may be possible to commence the internship year in January, and return to the academic program the following January. Interested students are encouraged to contact the Engineering Internship office.

Admission

Students are required to apply online to the Engineering Internship Program prior to October 15 in the Fall Term of their third year. Students who do not meet the application deadline should contact the Engineering Internship Office regarding admission.

To be admitted to the Engineering Internship Program, students must be full-time students in good academic standing after second year. Only students who are eligible for full-time registration in the Schulich School of Engineering at the time they apply for the internship program and at the time they expect to start their internship are eligible for access to the placement processes of the Engineering Internship Program. Students should refer to the Co-operative Education/ Internship section of this Calendar for general admission requirements.

Requirements

Students must complete a minimum of twelve months work experience while registered in the Internship courses, Internship 513.01-04 (Internship in Engineering I-IV), in addition to the regular requirements for the BSc in Engineering. Students who have completed any portion of the twelve month requirement will not be permitted to apply for positions that extend beyond either the sixteen month maximum permitted to complete the requirements, or the date on which they are expected to resume their academic program.

Regulations

If a student's academic performance in the third year results in the student being required to withdraw from the Schulich School of Engineering, the student will be required to withdraw from the Engineering Internship Program. Students who have been required to withdraw from the Engineering Internship Program will no longer have access to the program's job search systems or support. If the student is required to withdraw from the Engineering Internship Program but has already accepted a placement, the employer will be informed that the student is no longer registered in the Internship Program.

Students who have completed the twelve month minimum requirement will not be permitted to apply for further internship positions.

Students who have accepted a placement obtained through the Internship Placement process will be registered in the required Internship courses corresponding to the length of the placement and appropriate fees will be payable.

In order to have the Internship designation appear on the BSc parchment, a student must complete the twelve-month minimum requirement and pass the requisite internship courses.

Each work experience is supervised by a Professional Engineer in the host company. Normally the entire internship year is spent with the same employer.

4.15 Minor in Entrepreneurship and Enterprise Development in the Schulich School of Engineering

Introduction

The Schulich School of Engineering in partnership with the Haskayne School of Business offers a Minor in Entrepreneurship and Enterprise Development (MEED) open to all engineering students. MEED typically commences in Year Two of the engineering program and consists of five Entrepreneurship and Innovation (ENTI) courses, all of which are currently offered by the Haskayne School of Business plus any five fourth-year engineering courses that are taken as part of the normal requirements for the engineering degree. Thus, to satisfy MEED requirements, students must receive credit for 15 units (2.5 full-course equivalents) over and above the engineering degree requirements.

Admission

Students apply for admission to MEED at the same time as they apply for their choice of engineering program specialization, in April of their first year. Admission to the MEED program is limited to 50 students. In the event that the number of applicants exceeds the number of spaces available, admission will be decided on the basis of academic performance, using the same process as is used for admission to the engineering program specialization. If students apply later in their program than second year, they will be admitted in order of academic performance according to the number of spaces available. Students are encouraged to apply as soon as possible in order that the Haskayne School of Business may plan for the required number of places in the ENTI courses. Application forms are available from and should be submitted to the Engineering Student Centre. Admission to the program depends upon the availability of space in the required ENTI courses.

Requirements

Students must receive credit for 15 units (2.5 full-course equivalents) in addition to 15 units (2.5 full-course equivalents) fourth-year engineering courses that are part of the undergraduate engineering degree requirements. The five courses that are to be completed in addition to the engineering degree requirements are:

1. Entrepreneurship and Innovation 201 Introduction to Business Venturing

2. Entrepreneurship and Innovation 381 Principles of Entrepreneurship

3. Entrepreneurship and Innovation 401 Opportunity Identification

4. Entrepreneurship and Innovation 405 New Venture Start-Up

5. One of the following options:

Business and Environment 395 Business Law for Strategic Decision-Makers*

Business Technology Management 321 Information Technology in Business

Entrepreneurship and Innovation 403 New Venture Planning

Finance 341 Canadian Business Finance

Finance 343 Personal Financial Management

Human Resources and Organizational Dynamics 321 Foundations in the Human Resources and Organizational Dynamics**

Marketing 341 Introduction to Marketing

Operations Management 301 Introduction to Production and Operations Management**

**Not available as an option to Geomatics Engineering students who have completed Operations Management 301 as a Technical Elective in their Geomatics program.*

***Not available as an option to students in Manufacturing Engineering.*

Regulations

Regulations of the Schulich School of Engineering apply to students taking MEED courses. In order to have the Minor in Entrepreneurship and Enterprise Development appear on the student's transcript, the five-course MEED program must be completed before the student graduates.

4.16 International Foundations Program (IFP) Pathways

Students admitted to IFP Pathways complete a structured two-year curriculum in place of the regular Schulich School of Engineering first-year curriculum (4.1 First Year Curriculum). IFP Pathways students take the first-year engineering curriculum courses offered by the Schulich School of Engineering and the Faculty of Science, concurrently with English language support courses offered by the IFP over a two-year period.

IFP Pathways students' language support consists of:

- 4 academic language instructional courses (International Foundations Program, IFPX)
- 10 "adjunct" language support courses (International Foundations Program Engineering, IFPE) specific to the courses in the Schulich School of Engineering first-year curriculum

For students in the IFP Pathways program, the regular Schulich School of Engineering first-year curriculum (4.1 First Year Curriculum) is replaced by the following two-year curriculum. Upon successful completion of the IFP Pathways two-year curriculum, students will be placed into an Engineering program according to the process described under 3.1 Admissions ("Admission to Engineering Program").

Courses that span two terms can be taken in either term.

First IFP Pathways Year	
Fall	**Winter**
Mathematics 275	Mathematics 277
International Foundations Program Engineering 275	International Foundations Program Engineering 277
Engineering 233	Engineering 201
International Foundations Program Engineering 233	International Foundations Program Engineering 201
International Foundations Program 257	International Foundations Program 250
Second IFP Pathways Year	
Fall	**Winter**
Engineering 200	Physics 259
International Foundations Program Engineering 200	International Foundations Program Engineering 259
Mathematics 211	Engineering 202
International Foundations Program Engineering 211	International Foundations Program Engineering 202
Chemistry 209	Engineering 225
International Foundations Program Engineering 209	International Foundations Program Engineering 225
International Foundations Program 357	International Foundations Program 350

5. Administration

School Administrative Officers

Dean

W. Rosehart

Associate Deans

A. Nygren, Academic & Planning

Q. Sun, Equity & Diversity

J.L.H. Grozic, Research

M. Eggermont, Student Affairs

R. Hugo, Teaching & Learning

A. Sen, Student Professional Development

Faculty of Science

1. Summary of Programs

Degrees Offered*

Department and Program		Undergraduate	
	Core	Enhancements	Combined Degrees[1,7]
Department of Biological Sciences			
Biochemistry	BSc	BSc Honours	
Biological Sciences	BSc	BSc Honours	
Cellular, Molecular and Microbial Biology	BSc	BSc Honours	
Ecology	BSc	BSc Honours , BSc Co-op, BSc Co-op Honours	
Plant Biology	BSc	BSc Honours	
Zoology	BSc	BSc Honours	
Department of Chemistry			
Applied Chemistry[2]	BSc Co-op	BSc Co-op Honours	
Chemical Physics		BSc Honours	
Chemistry	BSc	BSc Honours	
Department of Computer Science			
Computer Science	BA[3], BSc	BSc Honours, BSc Internship, BSc Internship Honours	BComm/BSc[5]
Department of Geoscience			
Applied and Environmental Geology[4]	BSc	BSc Honours	
Geology	BSc	BSc Honours	
Geophysics	BSc	BSc Honours	
Department of Mathematics and Statistics			
Actuarial Science	BSc	BSc Honours, BSc Co-op, BSc Co-op Honours	BComm/BSc[5]
Applied Mathematics	BSc	BSc Honours	
General Mathematics	BSc		BSc/BEd[6]
Pure Mathematics	BSc	BSc Honours	
Statistics	BSc	BSc Honours	
Department of Physics and Astronomy			
Astrophysics	BSc	BSc Honours	
Physics	BSc	BSc Honours	
Non-Departmental Programs			
Environmental Science	BSc	BSc Honours	
Neuroscience	BSc Honours Only		
Nanoscience	Minor only		
Natural Sciences	BSc	BSc Honours	BSc/BEd[6]

**Graduate degrees are offered in all Departments within the Faculty of Science. Details of graduate specializations can be found in the graduate section of this calendar.*

[1]All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs in the Faculty of Arts.

[2]Please note this program is undergoing review.

[3]Combined Degree with the Faculty of Arts (Please note this program is currently undergoing review.)

[4]Admission to the Applied and Environmental Geology degree is suspended as of Fall 2015.

[5]Combined Degree with the Haskayne School of Business.

[6]Concurrent Degree with the Werklund School of Education.

[7]BSc and BSc Honours degrees can be combined with BSc degrees from the Schulich School of Engineering as described in section 3.4.H.

Table of Contents

Through its six Departments of Biological Sciences, Chemistry, Computer Science, Geoscience, Mathematics and Statistics, and Physics and Astronomy, and the USC Specialized Programs Office, the Faculty of Science offers the programs listed below.

The Faculty of Science is committed to providing students with rich undergraduate educational experiences that can be completed in four years. All BSc and BA programs within the Faculty normally require four years to complete, with the exception of the Combined Degree programs and the Co-operative Education/Internship programs that require at least five years. Students are encouraged to visit the Undergraduate Science Centre regularly throughout their degree for program advising and support in achieving the goal of completing their degree in the normal amount of time.

Students starting their first year of university may enter any Science Major programs designated for first-year students. Students who are undecided about which program to choose should register in the Natural Sciences program in first year. While registered in this program, they should register in the first-year courses that are appropriate to the future program of their choice.

Admission to some programs is based on selection criteria as described in Section 5 (Program Details).

Undergraduate Programs

Details on undergraduate programs are given in Section 5 (Program Details).

Degree Programs Within the Faculty of Science

- BSc Major Programs
- BSc Honours Programs
- Co-operative/Internship BSc Major Programs
- Co-operative/Internship BSc Honours Programs

- BSc Double Major Programs
- BSc Double Honours Programs
- BSc/BSc Combined Degree Programs within the Faculty of Science
- Second Degree Programs following an appropriate first degree: BSc Major or BSc Honours Programs

BA degrees may be conferred in programs in the Department of Computer Science if the program is part of a Double Major program with the second program in another faculty that only awards BA degrees.

Combined or Concurrent Degree Programs with Other Faculties

- BSc or BA (Science) and BSc or BA (Arts), administered jointly with the Faculty of Arts.
- BComm and BSc, administered jointly with the Haskayne School of Business.
- BSc (General Mathematics in Education) or BSc (Natural Sciences) and BEd, administered jointly with the Werklund School of Education.
- Combined BSc degree with Schulich School of Engineering.

Minor Programs

Science Minors are available in the following subjects:

Actuarial Science, Applied Mathematics, Astrophysics, Biological Sciences, Chemistry, Computer Science, Geology, Geophysics, Nanoscience, Physics, Pure Mathematics, Statistics.

Pre-Professional Preparation for Degree Programs at this and Other Institutions

The Faculty of Science admits students only to its degree programs. However, students who wish to transfer to a professional program are advised to choose a Faculty of Science program that best fits their professional aspirations and which, at the same time, permits them to work toward completing the chosen Science program, i.e., it is important to simultaneously satisfy both Faculty of Science program requirements as well as pre-professional requirements.

- Dentistry - the University of Alberta, Edmonton.
- Medicine - the University of Calgary, University of Alberta and various other institutions.
- Optometry - the University of Waterloo, Ontario.
- Veterinary Medicine - the University of Calgary and the Western College of Veterinary Medicine, Saskatoon, Saskatchewan

Students interested in applying to professional programs should contact the institution offering their desired program for details regarding the necessary pre-professional prerequisite requirements.

Graduate Programs

All Departments of the Faculty of Science offer graduate programs leading to Masters and Doctoral degrees. These programs are under the jurisdiction of the Faculty of Graduate Studies.

The normal preparation for graduate studies will be an Honours degree in the chosen subject.

Details on graduate programs are given in the Calendar of the Faculty of Graduate Studies.

2. Faculty Student Affairs

All programs offered by the Faculty of Science are administered by the Undergraduate Science Centre, in collaboration with the six departments within the Faculty and the Directors of the Environmental Science, Nanoscience, Natural Sciences and Neuroscience programs. Advice on these programs is available in the Undergraduate Science Centre, as well as Department and Program Directors' offices.

General inquiries related to the Faculty Regulations described in Section 3 should be directed to the Undergraduate Science Centre. Specific inquiries related to course requirements, as described in Section 5, can be directed to the Undergraduate Science Centre, but often the Associate Head in the Department or Program Office concerned may be in a better position to answer these. Information on student advising is given in Section 5.

Undergraduate Science Centre

Location: Energy Environment Experiential Learning (EEEL) 445

Telephone: 403.220.8600

Faculty of Science website: ucalgary.ca/science/

Undergraduate Science Centre website: ucalgary.ca/usc

Email address: usc@ucalgary.ca

3. Faculty Regulations

Students in the Faculty of Science are governed by the regulations in this section of the Calendar as well as by the general University regulations in the sections titled Undergraduate Admissions and Academic Regulations. For the precise interpretation of any statement or regulation, students should feel free to contact the Associate Dean (Undergraduate) of Science, telephone 403.220.7783. The Dean has delegated responsibility for undergraduate student affairs in the faculty to the Associate Dean (Undergraduate).

3.1 Terminology

Please refer to the glossary at the back of this Calendar.

3.2 Admission

All programs offered by the Faculty of Science have a fixed number of places for students. For any given program, whenever demand exceeds capacity enrolment will be limited and students will be admitted on the basis of descending ranked academic performance until that capacity is met. Specified selection criteria are described in Section 5 (Program Details) under the appropriate Department.

Direct entry is possible to most Science Major programs. Entry to most Science Honours programs is possible only after successful completion of at least 30 credits (5.0 full-course equivalents). A limited number of programs offer direct entry into a Science Honours program for highly qualified high school students. These programs are Biochemistry; Cellular, Molecular and Microbial Biology; Chemical Physics; Ecology; Neuroscience; Plant Biology; and Zoology. Students who do not enter an Honours program at the time of admission, can be considered following the completion of at least 30 credits (5.0 full-course equivalents).

Repeated courses may only be counted once in a student's degree program but all instances (that fall within the group of courses used to calculate admission) are used in the calculation of the admission grade point average.

For additional admission requirements, refer to the departmental sections.

Students may transfer from one program to any other for which they are eligible.

Continuing University of Calgary students may request a change of program online using the Student Centre. Changes in program include transfer to a program in the Faculty of Science, either from another faculty or from within the Faculty of Science, including transfer from a Major to an Honours program, and designation of a Minor. If an application is unsuccessful, a new application must be submitted in the following year.

To be eligible for admission, a student must meet the following requirements:

Major Programs

High school matriculation or equivalent. All applicants should have English Language Arts 30-1, Mathematics 30-1 or Pure Mathematics 30 and three additional 30-level subjects (of which two must be science courses). Incoming students should complete the appropriate high school 30/31 courses that support their expected first-year course registrations and that are listed in A.2 in the Undergraduate Admissions section of this Calendar.

Students who have completed some university-level course work must consult A.2 in the Undergraduate Admissions section of this Calendar for details.

Honours Programs

Admission to an Honours Program requires successful completion of at least 30 units (5.0 full-course equivalents) (with the exception of programs which offer direct admission from high school. These programs are described above under 3.2 Admission). At the time of admission, students must present (i) a GPA of at least 3.30 calculated over the most recent course work to a maximum of 60 units (10 full-course equivalents), and (ii) a GPA of at least 3.30 calculated for all science courses included in (i) above (University of Calgary courses and/or transferable courses taken at other institutions).

For continuation in an Honours program, students are subject to an annual review at the end of the winter semester. Students must maintain a GPA of 3.30 over

the courses subject to assessment and on all science courses within those subject to assessment. If fewer than 60 units (10.0 full-course equivalents) have been completed then all courses will be subject to assessment; if more than 60 units (10.0 full-course equivalents) have been completed, then only the most recent 60 units (10.0 full-course equivalents) are subject to assessment. Students whose review GPA is between 3.20 and 3.30 will be placed on notice that they may not be able to complete their Honours degree if their academic achievement does not improve to the level required by graduation requirements. Students who wish to reapply to an Honours Program must meet the admission requirements stated above. Students may apply for Honours after the first, second or third year of their program, but need to plan their program at an early stage in order to be able to meet all Honours Program Requirements. See 3.4 Program Requirements.

Students who wish to change from a Major to an Honours program, must meet the deadline for submission of their application.

Note: The BSc (Honours) in the following programs permits direct entry into first year:

Biochemistry; Cellular, Molecular and Microbial Biology; Ecology; Neuroscience; Plant Biology; and Zoology.

Second Baccalaureate Degrees

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to programs leading to a Second Baccalaureate Degree with a Major Field or a Second Baccalaureate Degree program with Honours in a Major Field.

Students must apply to the Admissions Office and meet all deadlines and requirements. For more information on admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions. For more information regarding requirements for a second degree, refer to 3.4 Program Requirements.

3.3 Enrolment Limitations

Enrolment limitations may be in effect for courses in the Faculty of Science.

Any of the junior (200-level) courses offered by the Faculty of Science may be so limited. Students must consult the current Schedule of Classes for information about registration priorities in such courses.

At the senior level (courses numbered 300 or above), many courses in several departments may have limited enrolment, with selection based on academic merit when demand exceeds available space. Selection criteria are described in Section 5 (Program Details) under the appropriate Department.

3.4 Program Requirements

The following general requirements apply to all programs administered by the Faculty of Science. In addition, there are the course requirements for the individual programs. These are listed in Section 5 (Program Details).

Table I

The following courses may form part of a student's degree program in Science, but may not be used to satisfy the requirement of 18 units (3.0 full-course equivalents) from outside the Faculty.

Anthropology 309, 413, 425, 435, 451, 552, 571
Archaeology 203, 417, 555
Business Technology Management 321, 331
Chemical Engineering 427, 501, 535, 537, 541
Civil Engineering 461
Computer Engineering 339, 369, 467
Electrical Engineering 327, 353, 469, 475, 563, 565, 575, (if both 563 and 565 are taken, one may be counted as from outside Science)
Engineering 201, 233, 311, 317, 319, 349, 407
Energy and Environment, Engineering 355
Geography 305, 307, 313, 415, 417
Kinesiology 259, 260, 263, 363, 463
Mechanical Engineering 479, 485
Medical Science (all courses in this category)
Political Science 399
Psychology 312, 407, 478, 531
Sociology 311, 315

A. Major Degree Programs

A student must present an approved list of courses completed with passing grades. This list will be referred to as the program. The program must satisfy the following conditions.

(a) The program must contain at least 120 units (20.0 full-course equivalents) with a maximum of 48 units (8.0 full-course equivalents) at the 200 level.

(b) The program must contain at least 48 units (8.0 full-course equivalents) in a Science field. Maximum allowable courses limits are specified in program regulations for each degree. The field chosen for a program will be referred to as the "major field." The Science fields are listed in Section 5 (Program Details). Only 6 units (1.0 full-course equivalent) in the major field may be a "D" or "D +".

(c) The GPA calculated over the program must be at least 2.00, and the GPA for courses in the major field must also be at least 2.00. The program may not contain more than 18 units (3.0 full-course equivalents) with "D" or "D+" grades.

(d) Breadth requirement: The program must contain at least 54 units (9.0 full-course equivalents) from outside the major field, of which at least 18 units (3.0 full-course equivalents) must be courses selected from Faculties other than the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.

The 18 units (3.0 full-course equivalents) from other faculties may **not** be chosen from among the courses listed in Table I. The requirement to include 18 units (3.0 full-course equivalents) in other areas is intended to broaden the student's perspective beyond ones offered by the Faculty of Science.

Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other faculties.

(e) The program must include certain specified courses. The specified courses required for individual programs are listed in Section 5 (Program Details).

(f) No more than 60 units (10.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be included in the program. A maximum of 24 units (4.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be included in the major field.

(g) Credit will not be granted toward Science degrees for Physical Activity courses (i.e., Dance Education Activity/Theory, Outdoor Pursuits Activity/Theory, and Physical Education Activity/Theory).

Note: These requirements may change with every Calendar issue. A given Calendar issue applies to the academic year beginning on July 1 and ending on the following June 30. The time of entry into a program in the Faculty of Science is defined as the first session after admission to the program during which a student successfully completes any courses applicable to the program. A student's program is subject to the course requirements which are in the Calendar current at the time of entry into the program, and a student is allowed five years counted from the time of entry into the program to graduate under these requirements. Students in Co-operative Education or Internship programs have six years counted from the time of entry into the program to graduate under these requirements.

Students who exceed this five-year limit must consult with the Head of the Department (or designate) or Program Director (or designate) concerned who will decide on an acceptable set of course requirements for the proposed date of graduation. The Head (or designate) or Program Director (or designate) will communicate the decision to the Associate Dean (Undergraduate), or designate, in writing.

Note: Course work that forms part of the requirements from a student's major field as listed in Section 5 (Program Details) and which is more than six years old at the time of graduation may be included in the program only with written permission of the Head (or designate) of the Department or Program Director (or designate) concerned.

Note: Courses taken in the University of Calgary Faculties of Medicine or Veterinary Medicine (and, at the discretion of the Associate Dean, courses taken as part of a degree in Dentistry or Optometry or Medicine or Veterinary Medicine outside of Calgary) may be counted towards a BSc degree in the Faculty of Science if at least 90 units (15.0 full-course equivalents) have been taken in a Science program, and if the Science course requirements for a Science Major are met by those 90 or more

units (15.0 or more full-course equivalents). Honours degrees and degrees with distinction will not be granted in this manner. Not all Major programs can be completed in this way in three years.

B. Degrees "With Distinction"

The notation "With Distinction" will be entered in the permanent record and on the graduation parchment of a student successfully completing a Major program with a grade point average of at least 3.60 over the last 90 units (15.0 full-course equivalents) taken for the degree. In cases in which the "last 90" must include some but not all of a group of courses taken concurrently, the selection will be made in the manner most advantageous to the student.

A student who has taken part of their course work at another university or who has transferred into the Faculty at a relatively late stage may be granted a degree "With Distinction" at the discretion of the Faculty.

C. Honours Degree Programs

Degrees with Honours are awarded in two classes: Honours and First Class Honours.

The requirements are the same as for the Major Programs, except for the following additions or changes.

Honours Requirements

- A minimum GPA of 3.30 over the last 90 units (15.0 full-course equivalents).
- Completion of Honours requirements as outlined in Section 5 (Program Details).
- The program must contain at least 54 units (9.0 full-course equivalents) and no more than 78 units (13.0 full-course equivalents) in the major field.

Note: A student who fails to maintain the necessary performance standards or who decides not to continue in an Honours program may transfer to a Major program.

First Class Honours Requirements

In addition to the Honours requirements, successful completion of a department-approved program equivalent to 120 units (20.0 full-course equivalents), with a GPA of at least 3.60 over the last 90 units (15.0 full-course equivalents). A student who has taken part of their course work at another university may be granted a degree with First Class Honours at the discretion of the Faculty.

D. Co-operative Education/Internship Degree Programs

The Faculty of Science has Co-operative Education programs in Applied Chemistry, Ecology and Actuarial Science and one Internship program in Computer Science. Co-operative Education and Internship programs normally take five years to complete and include 12 to 16 months of paid supervised work experience in various private companies, government agencies and non-profit organizations. Apart from this work experience, the degree requirements are the same as for the regular Major and Honours programs. After second year, three or four work terms are interspersed with regular academic terms. Co-operative Education and Internship Programs provide students with opportunities to experience the linkages between academic knowledge and a variety of appropriate job situations. Students completing the requirements of the Co-operative Education and Internship option will graduate with "Co-operative Education" or "Internship" designated on their transcripts and degree parchments.

For general information on Co-operative Education and Internship programs refer to the Co-operative Education/Internship section of this Calendar. For specific program details, see Section 5 (Program Details) in the Faculty of Science section of the Calendar.

Students who wish to enter a Co-operative Education or Internship program are urged to discuss their pre-admission course selection with the Co-operative Education and Internship Co-ordinator in the Undergraduate Science Centre and the Undergraduate Co-ordinator of the Department offering the program as early as possible.

The general deadline for admission to a Co-operative Education or Internship program in the Faculty of Science is October 1. However, for some Co-operative Education programs, as for Internship programs, additional admission deadlines may be available. If so, these are listed in the Calendar section of the Department offering the program. Applications for admission to a Science Co-operative Education or an Internship program must be submitted to the Undergraduate Science Centre.

For continuation in Co-operative Education/Internship programs, students are required to maintain a minimum GPA of 2.30 or 2.70 (depending on the Major program) or 3.30 (Honours).

Note: Department requirements that exceed the Faculty minimum supersede these Faculty standards. Furthermore, students who receive a grade of "F" in a Co-operative Education/Internship course will be withdrawn from the Co-operative Education/Internship program and will not receive Co-operative Education/Internship designation.

Note: Developing and implementing job-search skills is a part of the Co-operative Education Program. The program does not guarantee that students will obtain work term placements.

Faculty of Science Co-operative Education and Internship Office

Location: Undergraduate Science Centre (Specialized Programs Office)

Energy Environment Experiential Learning (EEEL) 426

Phone: 403.220.8600

Email address: scicoop@ucalgary.ca

Website: ucalgary.ca/science/internshipcoop

E. Double Major and Double Honours Degree Programs

These are single degree programs. A student in a Major program whose program also meets the requirements for a second Major in a different field, in either the Faculty of Science or another faculty, may declare a second Major in this field. The same is true for Honours programs. It is not possible for one of the two programs to be an Honours program and for the other one to be a Major program.

Declaration of the second Major or Honours may be made no later than at the time of the last registration. Special restrictions apply to certain double Major or Honours combinations. Consult the relevant Department in Section 5 (Programs Details). All such double Major or Honours combinations must be able to be accommodated under the same rubric (either BSc or BA).

F. Combined Degree Programs Within the Faculty of Science

Students may pursue a combined program of at least 150 units (25.0 full-course equivalents) that leads to two degrees from the Faculty of Science. The two degrees will be awarded simultaneously. Interested students should consult with program advisors in the Undergraduate Science Centre and the Associate Dean (Undergraduate).

The two programs may not be from the same Department, except for combinations of Geophysics with Geology or Environmental Science.

G. Second Degree Programs

The graduation requirements for a second degree are the same as those for a degree with a Major field except for the following:

Major Degree Requirements

(a) Up to 60 units (10.0 full-course equivalents) counted towards any previous degrees may be counted towards requirements in the second degree. These may not include more than half the minimum number required in the new Major field.

(b) Courses not used toward previous degrees (as determined by the institution awarding those degrees) may be used to reduce the number required in the second degree where applicable.

(c) Students normally will not be admitted to a second degree program in any field in which they already possess a degree. Students with a degree in the Natural Sciences should consult the Undergraduate Science Centre to find out whether they would be permitted to enrol in a program that covers the same subject matter as their Concentration One.

Upon admission to the program, students are advised to contact the Undergraduate Science Centre to discuss their academic plans and obtain general advice regarding the requirements of the second degree. The Undergraduate Science Centre will then prepare a detailed formal assessment outlining the remaining requirements in each individual case.

The second degree will be awarded "With Distinction" if a GPA of at least 3.60 is achieved over the courses completed in the second degree program, excluding those used in point (a).

Note: Departments are under no obligation to compress their course offerings in such a way as to minimize the time spent on a second degree.

Honours Degree Requirements

The graduation requirements for a second degree in Honours is the same as a degree with Honours, with the following modifications:

(a) Admissibility will be based on the overall grade point average obtained in the first degree, and grade point averages required for graduation will be calculated using courses completed in the second degree program.

(b) The student must obtain approval of the Department or Program concerned.

(c) The permissible duration of the second degree program will be determined by the Associate Dean (Undergraduate), or designate, at the start of the program in conformity with the spirit that governs the duration of a first degree honours program, taking into account what courses remain to be taken in the second degree program.

(d) The degree will be awarded as First Class Honours if a GPA of at least 3.60 is obtained over the courses completed in the second Honours degree program.

H. Combined and Concurrent Degree Programs with Other Faculties

Students may pursue a combined program of at least 150 units (25.0 full-course equivalents) that leads to two degrees, one from the Faculty of Science and one from another faculty. The two degrees will be awarded simultaneously.

Students must meet the admission and graduation requirements of both Faculties involved, as described in the Faculties' sections of this Calendar.

These programs require careful selection of courses to complete the requirements of both faculties. Interested students are urged to contact the Advising Offices of both faculties for advice in choosing their courses, beginning in first year, and should see the Associate or Assistant Deans of the two Faculties involved.

With the Faculty of Arts

BSc or BA (Science) and BSc or BA (Arts) Program

Students intending to pursue this program may enter either the Faculty of Science or the Faculty of Arts. At the time of admission to either faculty, students must apply for the combined degree program and declare two major fields as described in each faculty's section of this Calendar.

Degree Requirements for the BSc or BA (Science) and BSc or BA (Arts) Program

(i) The Faculties of Science and Arts require the successful completion of at least 42 and not more than 66 units (7.0 and not more than 11.0 full-course equivalents) in the Major Field. Faculty and departmental requirements for graduation in a program with a Major Field must be met.

(ii) Courses taken to satisfy the major field requirements for one of the two degrees may be counted towards the breadth requirement for the other degree.

(iii) The number of junior courses taken must not exceed 54 units (9.0 full-course equivalents) in total.

(iv) A maximum of 60 units (10.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be included in the combined programs. A maximum of 24 units (4.0 full-course equivalents) taken at other institutions and acceptable for transfer credit may be included in the major field of each program.

With the Haskayne School of Business

BComm and BSc (Actuarial Science) Program

For program details, please see the Haskayne School of Business section of this Calendar.

BComm and BSc (Computer Science) Program

For program details, please see the Haskayne School of Business section of this Calendar.

Concurrent Degrees with the Werklund School of Education

BSc (General Mathematics in Education) and BEd

For program details, please see the Department of Mathematics and Statistics section in Section 5 (Program Details).

BSc (Natural Sciences) and BEd

For program details, please see the Natural Sciences section in Section 5 (Program Details).

With the Schulich School of Engineering

BSc (Science) and BSc (Engineering) Program

Students intending to pursue this program may enter either the Faculty of Science or the Schulich School of Engineering. Students may either be admitted to both degree programs when they first apply to the University or may seek admission to a second degree program after being admitted. Students must satisfy the requirements for admission to both Faculties and Programs. (See the Undergraduate Admissions section of this Calendar.)

This combined program leads to a Bachelor of Science in Engineering from the Schulich School of Engineering and a Bachelor of Science from the Faculty of Science. The Schulich School of Engineering provides complementary information on Combined Programs in their section of this Calendar.

Note: Because engineering degrees are highly structured, more than 150 units (25.0 full-course equivalents) are typically required. Further, students who opt out of this Combined Degree program, particularly if they do so after first year, often require more than four years to complete a single degree.

I. Minor Programs

The course requirements for the Minor Programs are listed in Section 5 (Program Details) under the appropriate Department. Students are cautioned to check the Calendar descriptions of the courses required for the Minor and to include the necessary prerequisites for these courses in their programs.

For a Minor, passing grades must be obtained in at least 30 units (5.0 full-course equivalents) in the minor field of which at least 18 units (3.0 full-course equivalents) must be numbered 300 or above. For certain major/minor combinations there will be considerable overlap between fields. The degree of permissible overlap must be discussed with the Associate Dean (Undergraduate), or designate, before proceeding. The GPA over all courses counting towards the Minor must be at least 2.00 and only 6 units (1.0 full-course equivalent) with a "D" grade will be allowed.

3.5 Course Selection and Registration

A. Accuracy of Registration

Students are responsible for ensuring that their annual course selections are in accord with all Calendar requirements, including the completion of prerequisite courses with a satisfactory grade and registration in corequisite courses as appropriate. If registration in any course(s) is contrary to regulations, the Faculty may cancel such registration anytime after the beginning of the term. Registration at all times must be appropriate to the degree program being followed. Students with wholly inappropriate course selections in their registration may have their registration cancelled by the Associate Dean (Undergraduate), or designate. Students should seek advice from that Associate Dean, the staff of the Undergraduate Science Centre, or from the Department or Program concerned.

Students are responsible for ensuring that they meet degree and program requirements. While the Undergraduate Science Centre endeavours to assist all students as they proceed in the various programs, a final and thorough check is not done until application for graduation. Any departure from standard requirements must receive prior authorization in writing from the Associate Dean (Undergraduate), or designate. It is strongly recommended that students consult with the Associate Dean before submitting their final registration.

First-year students in the Faculty of Science who wish to register in senior courses should be aware that in addition to stated prerequisites, senior courses offered by other faculties often require completion of 18 units (3.0 full-course equivalents) at the junior level.

Students must be admitted to a program before they will be allowed to register in more than 36 units (6.0 full-course equivalents) from the Department offering that program or in any group of courses required for that program.

First-year students should visit the Enrolment Services website (ucalgary.ca/registrar) for registration details from the Office of the Registrar.

B. Introductory Courses for Science Degree Programs

All programs have introductory course requirements. Since these courses are often the prerequisites for more advanced courses, students are advised to take the introductory courses in the manner depicted in Section 5, Program Details "Suggested Program Sequences." By so doing, students make it possible to complete their programs in a timely fashion.

C. Prerequisites

A student may not register in a course unless a grade of at least "C-" has been obtained in each prerequisite course, except with a letter of permission from the Head of Department (or designate). It is the responsibility of students to ensure that they meet all prerequisite requirements. Students who do not meet the exact prerequisites/corequisites and do not have Departmental permission to waive those requirements will have their registrations cancelled automatically by the Faculty after the deadline for student change of registration.

D. Withdrawal from Courses

Students will not be permitted to withdraw more than once from a particular course.

Students will be required to withdraw from the Faculty of Science if they have accumulated a total of more than 30 units (5.0 full-course equivalents) withdrawals while in attendance at the University of Calgary.

Since students could jeopardize their programs by withdrawing from courses, they should be aware of all potentially adverse consequences of such actions. If after having sought out and weighed all the information, a student still decides to proceed, withdrawal from a course must be done before the deadline specified in the Academic Schedule.

E. Repetition of Courses

A student will be permitted to repeat a particular course only once. This regulation applies not only to individual courses, but also to sets of courses where it is stated that credit for more than one of the sets is not allowed. For example, a student may not take Chemistry 355 twice and then attempt Chemistry 353.

F. Course Load

While five courses taken concurrently represent a full load, some programs prescribe additional courses. Students may elect to take up to six courses in a term, but an extra course represents a substantial burden and may adversely affect overall performance. Undergraduates may register in 600-level courses only with the permission of the Department offering the course and the Associate Dean (Undergraduate).

G. Opportunities to Take Courses at Another Institution for Transfer of Credit

Students may be authorized to take some program course work at another university if registration as a visiting student is acceptable to that university. Students with poor academic performance, such as being on probation or having a large number of withdrawals, will not be afforded this opportunity.

Students may apply online for such authorization by requesting a Letter of Permission through their online Student Centre. Students should check with Advisors in the Undergraduate Science Centre to ensure that such transfer credits advance their particular programs. Once approved, students will be advised officially as to how the proposed courses will transfer and an appropriate letter will be sent to the Registrar of the other university. The Letter of Permission must be obtained before the student registers for the courses at the other institution.

It will be the responsibility of the student to ensure that an official transcript of grades is forwarded directly to the Registrar of this University in order that appropriate credit may be officially recorded.

Many grade-point-average calculations used by the Faculty of Science do not include transfer courses.

H. Credit in Courses by Special Assessment

Students who feel that they know the material covered in a course without having received formal University credit for that course may apply for special assessment in such a course. Students should obtain the form headed "Permission to Take Courses by Special Assessment" from the Office of the Registrar and submit their application to the Department offering the course. A course in which the student was previously registered may not be taken subsequently by special assessment, nor may any course be attempted more than once in this way.

The Faculty will not allow more than 30 units (5.0 full-course equivalents) completed by special assessment to count towards a degree.

See also B.10.1 in Academic Regulations for the general University regulations concerning special assessment.

3.6 Assessment

A. Missed Components of Term Work

Any student who is absent from a test or fails to complete a laboratory assignment or similar work for legitimate reasons must discuss an alternative course of action with the instructor. The regulations covering such circumstances are outlined in the sections titled E.3 Attendance and G.7 Deferral of Term Work in the Academic Regulations section of this Calendar. Notification of such eventualities must be given to the instructor within 48 hours.

B. Deferral of Final Examinations

See G.6 in Academic Regulations for the general University regulations governing the deferral of final examinations.

In order to apply for a deferral of a final examination in a course taught by the Faculty of Science, students must pick up an application form at the Enrolment Services or download it from the Registrar's website at ucalgary.ca/registrar/exam_info and submit the completed form with all supporting documentation to Student Enrolment Services. Students seeking a deferment of a final examination for medical reasons must accompany the application form with a completed Physician/Counsellor Statement form, which may be obtained from the Office of the Registrar or may be downloaded from the Registrar's website. A medical certificate stating only that a student was seen by a physician is insufficient. Students are warned that trivial medical excuses also are insufficient and that their record of applications for previous medical deferrals will be checked when deferred privileges are applied for. Medical documentation that does not coincide precisely with the examination(s) missed will not be accepted.

Misreading the examination timetable is not a valid reason for requesting a deferred final examination.

In the event of foreseeable absence from a final examination, an application for a deferral must be made prior to the examination. In the event of an unforeseen need to be absent from such an examination, the Associate Dean (Undergraduate), or designate, should be notified as soon as possible and application made within 48 hours of the examination. Applications made after the deadlines printed in the Calendar will not be considered.

C. Supplemental Examinations

Supplemental examinations provide students with an opportunity to demonstrate competence in a course by re-writing the final examination. The primary goal is to allow students a chance to earn a "C-" grade in the course so they can use the course as a prerequisite. As such, if a student passes a supplemental examination, a "C-" will be the highest grade a student can achieve. If a student fails the supplementary examination, the original grade will stand.

Supplemental examinations are not available for all courses. Availability of supplemental exams is guaranteed only for courses that explicitly indicate on their official course outline that a supplementary examination is possible.

Additionally:

- No more than two supplemental examination privileges, in any University of Calgary course, may be granted to a student in one academic year,
- No more than four supplemental examination privileges will be granted to a student over their whole degree program.
- Only one supplemental exam will be allowed per course.

Supplemental examinations will normally be offered at the same time as deferred final examination for that course, during Spring/Summer intersession, or block weeks. Supplementary examinations may be in a different format than the regular final examination but will cover the same course material as the regular final examination. Supplemental

examinations are not normally allowed for deferred examinations. Exceptions require approval from the Dean or designate.

Supplemental exams do not replace the deferred examination process as outlined in Section G.6 by meeting the criteria set out below.

You are eligible for a supplemental examination if you meet the following requirements:

- You are in good academic standing,
- You have earned a cumulative grade of "C-" or better on coursework (e.g. laboratories, assignments, mid-term examinations, quizzes), and
- You achieved the minimum grade for any required term-work components as indicated on the course outline e.g. requirement to pass the lab component).

You are not eligible for a supplemental examination if you:

- Have been previously allowed to write a supplementary examination for the course.
- Earned a final grade greater than a "D+" in the course.
- Did not write the final or an approved deferred final examination in the course.
- Are on academic probation.
- Were assigned a failing grade in the course due to academic misconduct.
- Are a graduate student

Application Process:

Students who are eligible for a supplemental examination will be notified by the department offering the course. Students who indicate that they want to write the supplemental examination will be required to pay a non-refundable fee.

3.7 Student Standing

A. Dean's List

The Dean's List recognizes the outstanding achievement of students in the Faculty. It is compiled annually at the end of the Winter Term. A statement of inclusion on the Dean's List will be recorded on the student's transcript.

To qualify for the Dean's List, a student must achieve a grade point average of 3.60 or higher over all University of Calgary courses taken in the preceding Summer (including Spring Intersession), Fall and Winter Terms on:

(a) A minimum of 24 units (4.0 full-course equivalents) taken at the University of Calgary (while registered in a program in the Faculty of Science), OR

(b) A minimum of 24 units (4.0 full-course equivalents) taken at the University of Calgary plus successful completion of one four-month Co-operative Education work placement (while registered in a program in the Faculty of Science), OR

(c) A minimum of 12 units (2.0 full-course equivalents) taken at the University of Calgary (while registered in a program in the Faculty of Science), plus two Co-op work placements.

(d) A minimum of 12 units (2.0 full-course equivalents) taken at the University of Calgary (while registered in a program in the Faculty of Science), plus successful completion of one or more approved full-time terms abroad, OR

(e) A program of study assessed by the Student Accessibility Services to be equivalent to (a), (b), (c) or (d) for a particular student.

Notes:

- Where it is appropriate for a student to be assessed under provisions (d) or (e), the student must arrange for all necessary documentation to be received by the Associate Dean (Undergraduate), or designate, no later than May 15.
- Only University of Calgary grades for regular academic courses are used for the Dean's List; grades earned for Co-operative Education work placements or study-abroad terms do not enter into the grade point average calculations for (b), (c) or (d).
- Students on academic sanction are not eligible for the Dean's List.
- Students with deferred examinations and/or term work after Winter Term may not be eligible to be included on the Dean's List.

B. Performance Review, Probationary Status and Dismissal

The progress of students registered in the Faculty is monitored at least once per year after Winter Term. Students will be required to withdraw if they have accumulated a total of more than 30 units (5.0 full-course equivalent) withdrawals while in attendance at the University of Calgary.

The academic standing of students registered in the Faculty will be reviewed after each Winter Term provided that they have completed at least 18 units (3.0 full-course equivalents) at the University of Calgary since their previous review. (Students who have not completed 18 units (3.0 full-course equivalents) since the previous review will retain their existing status until the next subsequent review). All University of Calgary credit courses, which have been completed since the previous review, are used for the purpose of academic review. Students placed on academic probation or required to withdraw as a result of the academic performance review will be so advised in writing.

Notwithstanding the specific regulations pertaining to Student Standing, students' academic standing may be reviewed at any time and those with generally poor academic records may be placed or continued on academic probation or required to withdraw at the discretion of the Dean's delegate.

Academic Turnaround Program (ATP)

The Academic Turnaround Program (ATP) provides eligible students facing their first Required to Withdraw (RTW) ruling for academic reasons the opportunity to continue in their current science program or to seek admission to the Faculty of Science following a RTW ruling from their current faculty. Students in the Faculty of Science will receive a written invitation to participate in the Academic Turnaround Program from the dean or designate. Students accepted to the ATP may continue their studies under Special Academic Probation provided that they fulfill all requirements and are compliant with the conditions of the program. All ATP requirements will be provided to students in writing by the faculty dean or designate. Students who do not fulfill all requirements or who fail to meet the GPA criteria outlined below will be required to withdraw from the university and will be notified by the dean.

At the end of the following Winter Term, students' progress will be reviewed by the Faculty regardless of the number of courses completed. In order to continue on Special Academic Probation, students must receive a cumulative GPA of 2.00 across all courses taken in the previous Summer (including Spring Intersession), Fall and Winter Terms. Students who have completed 18 units (6 half courses) and received a cumulative GPA of 2.00 across all courses taken will have completed Special Academic Probation and are considered in good academic standing.

Students who are non-compliant with any of the ATP conditions will be required to withdraw. Students may only participate once in the ATP.

C. Students in Satisfactory Standing

(a) Will retain that standing if they have achieved a GPA of at least 2.00 over all courses taken since the previous review;

(b) Will be required to withdraw if they have achieved a GPA less than 2.00 over all courses taken since their previous review and they have a probationary period within the last five years. (Probationary periods that have occurred in excess of five years previous will not be counted);

(c) Will be placed on academic probation if they have achieved a GPA of at least 1.70 but less than 2.00 over all courses taken since their previous review and have not been on academic probation within the preceding five years;

(d) Will be required to withdraw from the Faculty if they have achieved a GPA of less than 1.70 over all courses taken since their previous review.

D. Students on Academic Probation

(a) Will be reinstated in satisfactory standing if they have achieved a GPA of at least 2.00 over all courses taken since their previous review;

(b) Will be required to withdraw from the Faculty if they have achieved a GPA of less than 2.00 over all courses taken since their previous review.

E. Readmission

- Students who have been required to withdraw for unsatisfactory academic performance may be considered for re-admission after 12 or more months have elapsed since the date of dismissal.

- Applicants must apply by the deadlines stated in the current Calendar and meet the current admission requirements of the program to which they are seeking admission.
- Readmission is not guaranteed.
- Students should note that it is not normally possible to be readmitted without taking courses to meet the admission average.

Students so readmitted must maintain a grade point average of at least 2.00 on all courses taken in each academic review period after readmission. Failure to do so will result in permanent dismissal from the Faculty of Science. Students who have twice been required to withdraw from one or more Faculties at this or any other institution will not normally be considered for admission at any time.

4. Administration

Faculty Administrative Officers

Dean

L. Rigg

Vice Dean and Associate Dean (Research)

B.A. Keay

Associate Deans

T. Dinh, Student Affairs

L.F. Reid, Teaching and Learning

C.M. Graham, Undergraduate

5. Program Details

5.1 Biological Sciences

Degrees Offered*

Undergraduate Programs**	Core	Enhancements
Biochemistry	BSc	BSc Honours
Biological Sciences	BSc	BSc Honours
Cellular, Molecular and Microbial Biology	BSc	BSc Honours
Ecology	BSc	BSc Honours, BSc Co-op, BSc Honours Co-op
Plant Biology	BSc	BSc Honours
Zoology	BSc	BSc Honours

**There are many options for graduate studies leading to MSc and PhD degrees in the area of Biological Sciences. Details of graduate specializations can be found in the graduate section of this calendar.*

***All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Centre (USC) to develop a degree completion plan.*

Programs Offered in Biological Sciences

BSc and BSc Honours in Biochemistry; Biological Sciences; Cellular, Molecular and Microbial Biology; Ecology; Plant Biology; Zoology

BSc and BSc Honours in Ecology Co-operative Education

Minor in Biological Sciences

Department vs. Faculty Regulations

Programs in the Department of Biological Sciences are governed by a combination of general Faculty of Science regulations and the additional program specific regulations listed below.

It is **essential** for students to be familiar with **both** sets of regulations. It is helpful to read the Faculty regulations in Section 3 first.

Students should consult the Degree Navigator periodically to ensure that requirements are being met. Also students are strongly urged to consult the Department and the Undergraduate Science Centre (USC) at all stages of their program.

Department Information

Student enquiries: 403.220.3140

Department Office: Biological Sciences 186

Other enquiries: 403.220.5261

Fax: 403.289.9311

Website: bio.ucalgary.ca/

Enrolment Limitations

Enrolment Limitations in Programs, Admissions and Student Standing

Admission to programs in the department is competitive. Admission will be granted for Fall Term only and will be based upon academic merit. Academic performance will be measured on the basis of the grade point average calculated over the most recent 30 units (5.0 full-course equivalents) (University of Calgary courses and/or transferable courses taken at other institutions). (New admissions to the University are always subject to A.2 as stated in the Undergraduate Admissions section of this Calendar.)

Applications to the Department of Biological Sciences programs are accepted:

- Directly from High School (see Section 3.2 Admissions) into either the Biological Sciences program, or into Honours Biochemistry; Honours Cellular, Molecular and Microbial Biology; Honours Ecology; Honours Plant Biology; or Honours Zoology.
- From external transfer students and change of program requests from University of Calgary students into the Biological Sciences program.
- Subject to the Honours qualifications set out in Subsection 3.2 – Honours Programs, and to availability of space, students may request placement into any of the Honours programs offered by the Department.
- From external transfer students and change of program requests from University of Calgary students into BSc programs in Biochemistry; Cellular, Molecular and Microbial Biology; Ecology; Plant Biology; and Zoology after completion of a minimum of 30 units (5.0 full-course equivalents).

Notes:

- Students who are considering one of the BSc programs described above should plan to complete Biology 311, 371, 331 and at least one of Biology 313 and Biochemistry 393 by the end of their second year. Students should check the specific requirements for the program into which they plan to transfer, as some programs require both Biology 313 and Biochemistry 393.
- Any student in an Honours program is subject to the provisions for continuation in an Honours program, Subsections 3.2 and 3.4C.
- Honours students who do not qualify for continuation will be moved into the Biological Sciences BSc Program unless they have completed Biology 311, 371, 331 and one of Biology 313 or Biochemistry 393 prior to their review period and meet the minimum GPA requirement for admission into the specialized program. Students with a GPA of less than 2.000 are subject to the provisions of 3.7 Student Standing, B. Performance Review, Probationary Status and Dismissal.
- Students will be notified of the results of their application by email (results will not be provided by telephone).

Enrolment Limitations in Courses

Enrolment in many courses offered by the Department of Biological Sciences is limited by available laboratory or tutorial space.

Consult the Schedule of Classes for details regarding enrolment in these courses.

Transfers between Alberta Universities and Colleges

The Departments of Biological Sciences at the Universities of Alberta and Calgary and the Department of Biology at the University of Lethbridge have a transfer agreement in effect. The full details of the Biological Sciences Transfer Agreement are available in the Alberta Transfer Guide published by the Alberta Commission on Admissions and Transfer (ACAT) - acat.gov.ab.ca/.

Ethics in the Biological Sciences

Studies in the Biological Sciences involve the use of living and dead organisms. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with

the Undergraduate Program Director of the Department.

5.1.1 Common First and Second Years

See the Faculty of Science subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Required Courses

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 331, 371 and at least one* of Biology 313 and Biochemistry 393

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213**

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277 (see **Recommendations** below)

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or Computer Science 235 and a senior Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223 (see **Recommendations** below)

6 units (1.0 full-course equivalent) - Major options and/or options combination (see **Second Year** in the **Program Sequence Table** below)

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option***

12 units (2.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science****

**Students planning to pursue the Biological Sciences, Plant Biology and Zoology programs require both Biology 313 and Biochemistry 393. Students pursuing the Biochemistry and Cellular, Molecular and Microbial Biology programs require Biochemistry 393. Students pursuing the Ecology program require Biology 313. Students in any program may take both courses should they desire. Consult specific program requirements for details.*

***Chemistry 201 and 203 are offered in both Fall and Winter terms and may be done in any order. Chemistry 211 and 213 are recommended for students majoring in Chemistry and other students with strong backgrounds in chemistry.*

****Check details of other programs in the Department of Biological Sciences to see where Chemistry 353 is a requirement.*

*****These 12 units (2.0 full-course equivalents) form part of the 18 units (3.0 full-course equivalents) options from outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents) students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts. (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Recommendations

- Biology 241, 243, 311, 331 and 371 and at least one of Biology 313 or Biochemistry 393 should be taken in the sequence described below if students wish to pursue any of the degree programs offered by the Department of Biological Sciences.
- Students who have completed Mathematics 31 can take Mathematics 265 unless they are interested in pursuing programs in Physics and Astronomy or Mathematics and Statistics. Students interested in those programs are encouraged to take Mathematics 275.
- Students planning a Biochemistry major must take Physics 211 or 221, and 223.
- Students planning a Zoology major must take either the Physics option (Physics 211 or 221, and 223) or the Geology option (Geology 201 and 202).
- Students planning an Ecology or Zoology major are advised to take a course in linear methods (i.e., Mathematics 211 or 213).
- Prior to registering in the second year, students should consider which program they wish to pursue in the third and subsequent years so that an appropriate choice of major access courses may be made (see **Second Year** in the **Program Sequence Table** below).
- Chemistry 355 is an acceptable substitute for Chemistry 353; it is recommended that students planning Biochemistry Honours complete Chemistry 355.

Common First and Second Years Program Sequence

First Year for All Programs	
Biology 241	Biology 243
Chemistry 201 or 203 or 211	Chemistry 201 or 203 or 213**
Mathematics 249 or 265 or 275	Mathematics 211 or 213 or 267 or 277
Choose either Computer Science 217 or 231 or 235 or Geology 201 or Physics 211 or 221*	Continue Computer Science with Computer Science 219 or 233 or Computer Science option if 235 is chosen or continue Geology with Geology 202 or continue Physics with Physics 223
Non-science option	Non-science option
Second Year for All Programs	
Non-science option	Non-science option
Biology 311	Biochemistry 393* or option
Biology 313* or option	Biology 313* or option
Biology 371	Biology 331
Chemistry 351	Chemistry 353 or option*
Choose from the following to prepare for the third and fourth years of the intended Major.	
Biochemistry:	
Chemistry 311	Chemistry 315
Biological Sciences:	
	Option
Cellular, Molecular and Microbial Biology:	
Option	Cellular, Molecular and Microbial Biology 343
Ecology:	
	Biology 315
Plant Biology:	
	Plant Biology 327
Zoology:	
	Zoology 379 or 375

**Check details of programs in the Department of Biological Sciences to see where this is allowed.*

***Students wishing to take Chemistry 213 must take either Chemistry 201 or 211 as the prerequisite. Chemistry 201 and 203 are offered both in Fall and Winter Terms and students may complete them in any order.*

5.1.2 Programs in Biochemistry

See the subsections on Faculty of Science Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Courses constituting the field of Biochemistry

- All courses labelled Biochemistry, except Biochemistry 341
- Biology 241, 243, 311, 331, 371
- Cellular, Molecular and Microbial Biology 411
- Certain Medical Science courses*
- Certain 600-level courses may be considered to fulfill program requirements. Consult the department for further information.

**No more than 6 units (1.0 full-course equivalent) of such courses (approved by the Department prior to registering in the course) can be counted towards the Major Field.*

Required Courses - Major Program

See also 3.4 Program Requirements, in particular, the regulations on the number of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

15 units (2.5 full-course equivalents) - Biology 241, 243, 311, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biochemistry 393

6 units (1.0 full-course equivalent) - Chemistry 351 and 353

6 units (1.0 full-course equivalent) - Chemistry 311 and 315

12 units (2.0 full-course equivalents) - Biochemistry 401, 403, 431, and 471

18 units (3.0 full-course equivalents) - Chosen from Biochemistry 443, 543, 547, 551, 553, 555, 561, 575, 577 or Cellular, Molecular and Microbial Biology 411

12 units (2.0 full-course equivalents) - Options selected from courses offered by the Faculty of Science

18 units (3.0 full-course equivalent) - Breadth requirement: Options from outside the Faculty of Science*

12 units (2.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from*

the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).

Required Courses - Honours Program

See also Section 3.4 Program Requirements, in particular, the regulations on the number of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

15 units (2.5 full-course equivalents) - Biology 241, 243, 311, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or 355

6 units (1.0 full-course equivalent) - Chemistry 311 and 315

12 units (2.0 full-course equivalents) - Biochemistry 401, 403, 431, and 471

18 units (3.0 full-course equivalents) - Chosen from Biochemistry 443, 543, 547, 551, 553, 555, 561, 575, 577 or Cellular, Molecular and Microbial Biology 411

12 units (2.0 full-course equivalents) - Options selected from courses offered by the Faculty of Science

6 units (1.0 full-course equivalent) - Biochemistry 530

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

6 units (1.0 full-course equivalent) - Options

**These 18 units (3.0 full-course equivalents) options are selected from faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Suggested Program Sequence

Third Year	
Biochemistry 401	Biochemistry 403
Biochemistry 431	Option from the Field*
Biochemistry 471	Option from the Field*
Science Option	Science Option
Non-science option	Non-science option
Fourth Year	
Biochemistry 530 (for Honours), option (for Majors)	Biochemistry 530 (for Honours), option (for Majors)
Option from the Field*	Option from the Field*
Option from the Field*	Option from the Field*
Science Option	Science Option
Option	Option

**Choose from either Biochemistry 443, 543, 547, 551, 553, 555, 561, 575, 577 or Cellular, Molecular and Microbial Biology 411.*

5.1.3 Programs in Biological Sciences

See the Faculty of Science subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Courses constituting the field of Biological Sciences:

- All courses labelled Biochemistry, except Biochemistry 341*
- All courses labelled Biology*, except Biology 205, 305, 307, 309, 375
- All courses labelled Cellular, Molecular and Microbial Biology*
- All courses labelled Ecology*
- All courses labelled Plant Biology*
- All courses labelled Zoology* except Zoology 269
- Most courses labelled Marine Science** including Marine Science 321, 420, 430, 440, 450, 451, 500, 507, 511, 515, 525, 537, 540, 544, 546, 572, 574, 582
- Medical Science 404 and certain other Medical Science courses***
- Neuroscience 411
- Anthropology 413, 425, 435, 451, 571, Archaeology 417, 555, Geography 417, Neuroscience 401, 541****
- Certain 600-level courses may be considered to fulfill program requirements. Consult the department for further information.

**Certain courses with restricted enrolments are available in the first instance to those Program Honours and Majors who have met all prerequisites and whose programs require such courses. After a specific registration period for those students, other students who have met all prerequisites may be accommodated. See Limitation of Enrolment for courses that may apply.*

***Applicability to the field depends upon the actual course content. Additional approvals will be granted on a course by course basis. Check the list published by the Department each February.*

****No more than 6 units (1.0 full-course equivalent) of such courses (approved by the Department prior to registering in the course) can be counted towards the Major Field.*

*****No more than 3 units (0.5 full-course equivalent) of the courses in this group may be counted towards the major field.*

Required Courses - Major Program

See also 3.4 Program Requirements, in particular, the regulations on the number of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223 (see Recommendations below)

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

27 units (4.5 full-course equivalents) - Options from the Field: 12 units (2.0 full-course equivalents) of which must be at the 400 level or higher

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

30 units (5.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Required Courses - Honours Program

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223 (see Recommendations below)

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

33 units (5.5 full-course equivalents) - At least 9 units (1.5 full-course equivalents) chosen from each of three of the areas that constitute the fields of Biochemistry, Cellular, Molecular and Microbial Biology, Ecology, Plant Biology and Zoology. Of these 33 units (5.5 full-course equivalents), at least 18 units (3.0 full-course equivalents) must be chosen from courses at the 400 level or higher.

Note: These courses must be different from the 18 units (3.0 full-course equivalents) required Biology courses listed above and Biochemistry 393.

6 units (1.0 full-course equivalent) - Biology 530*

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science**

18 units (3.0 full-course equivalents) - Options

**Honours students should plan to complete this course in their final year.*

***These 18 units (3.0 full-course equivalents) options are selected from faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Recommendations

- Major options should be selected to satisfy the requirements for entry into another chosen major program or to satisfy the requirements for the Biological Sciences program. (See Required Courses - Major Program and Required Courses - Honours Program.)
- Courses in Marine Science may be taken for credit during the summer and/or students may elect to spend the fall of either the third or fourth year attending the **Bamfield Fall Program**. Refer to the **Marine Science course listings** for details.
- Students in the Biological Sciences Major program are encouraged to meet with an academic advisor to plan out their course sequences for third and fourth year based on their areas of interest.

5.1.4 Programs in Cellular, Molecular and Microbial Biology

See the Faculty of Science subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Courses constituting the field of Cellular, Molecular and Microbial Biology

- Biochemistry 393, 443, 547, 555, 561
- Biology 241, 243, 311, 315, 331, 371, 435
- All courses labelled Cellular, Molecular and Microbial Biology
- Marine Science 500*, 501*, 502*, 507*
- Certain Medical Science courses**
- Neuroscience 411
- Plant Biology 401, 543
- Certain 600-level courses may be considered to fulfill program requirements. Consult the department for further information.

**Applicability to the field depends upon the actual course content. Approval will have to be granted on an individual basis. Check the list published by the Department each February.*

***No more than 6 units (1.0 full-course equivalent) of such courses (approved by the Department prior to registering in the course) can be counted towards the Major Field.*

Required Courses - Major Program

See also 3.4 Program Requirements, in particular, the regulations on the number of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

15 units (2.5 full-course equivalents) - Biology 241, 243, 311, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Cellular, Molecular and Microbial Biology 343

6 units (1.0 full-course equivalent) - Chemistry 351 and 353

3 units (0.5 full-course equivalent) - Biochemistry 443

6 units (1.0 full-course equivalent) - Cellular, Molecular and Microbial Biology 411, 527

12 units (2.0 full-course equivalents) - By completing one of the options below:

Cell Biology Emphasis: Cellular, Molecular and Microbial Biology 403 and three of Cellular, Molecular and Microbial Biology 413, 451, 461, 505, 511, 519, 523, 451, 531, 561

or

Microbiology Emphasis: Cellular, Molecular and Microbial Biology 421, 443 and two of Cellular, Molecular and Microbial Biology 431, 451, 461, 523, 543, 545, 549, 563, Biology 435 (course substitutions permitted with consent of the Department)

6 units (1.0 full-course equivalent) - Options from the Field

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

30 units (5.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Required Courses - Honours Program

15 units (2.5 full-course equivalents) - Biology 241, 243, 311, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Cellular, Molecular and Microbial Biology 343

6 units (1.0 full-course equivalent) - Chemistry 351 and 353

3 units (0.5 full-course equivalent) - Biochemistry 443

6 units (1.0 full-course equivalent) - Cellular, Molecular and Microbial Biology 411, 527

12 units (2.0 full-course equivalents) - By completing one of the options below:

Cell Biology Emphasis: Cellular, Molecular and Microbial Biology 403 and three of Cellular, Molecular and Microbial Biology 413, 461, 505, 511, 519, 523, 531, 561

or

Microbiology Emphasis: Cellular, Molecular and Microbial Biology 421, 443 and two of Cellular, Molecular and Microbial Biology 431, 461, 523, 543, 545, 549, 563, Biology 435

3 units (0.5 full-course equivalent) - Cellular, Molecular and Microbial Biology 451

3 units (0.5 full-course equivalent) - Cellular, Molecular and Microbial Biology 507.95

6 units (1.0 full-course equivalent) - Cellular, Molecular and Microbial Biology 530

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

24 units (4.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents). students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Suggested Program Sequence

Third Year	
Biochemistry 443	Cellular, Molecular and Microbial Biology 527
Cellular, Molecular and Microbial Biology 411	Cellular, Molecular and Microbial Biology 413 or 431 or option
Cellular, Molecular and Microbial Biology 403 or 443	Cellular, Molecular and Microbial Biology 451 (for Honours), option from the Field (for Majors)
Cellular, Molecular and Microbial Biology 421 or option	Option
Non-science option	Non-science option
Fourth Year	
Cellular, Molecular and Microbial Biology 530 (for Honours), option (for Majors)	Cellular, Molecular and Microbial Biology 530 continued (for Honours), option (for Majors)

One of: Cellular, Molecular and Microbial Biology 511, 519, 549 or 563	Cellular, Molecular and Microbial Biology 507.95 (for Honours), option from the Field (for Majors)
One of: Cellular, Molecular and Microbial Biology 511, 519, 549 or 563	One of: Cellular, Molecular and Microbial Biology 505, 523, 531, 561, 543 or 545
Cellular, Molecular and Microbial Biology 421 or option	One of: Cellular, Molecular and Microbial Biology 505, 523, 531, 561, 543 or 545
Option	Option

5.1.5 Programs in Ecology

See the Faculty of Science subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Courses constituting the field of Ecology

- Biology 241, 243, 311, 313, 315, 331, 371, 401, 451, 591
- Biochemistry 393
- All courses labelled Ecology
- Marine Science 321, 430, 450, 500**, 507**, 525, 537
- Certain Medical Science courses***
- Plant Biology 327*
- Zoology 375*, 379*, 515*
- Certain 600-level courses may be considered to fulfill program requirements. Consult the department for further information.

**A maximum of two of these courses may be counted towards the field.*

***Applicability to the field depends upon the actual course content. Approval will have to be granted on an individual basis. Check the list published by the Department each February.*

****No more than 6 units (1.0 full-course equivalent) of such courses (approved by the Department prior to registering in the course) can be counted towards the Major Field.*

Required Courses - Major Program

See also 3.4 Program Requirements, in particular, the regulations on the distribution of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or Geology 201 and 202 or 203 or Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biology 315

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

3 units (0.5 full-course equivalent) - Biology 401

15 units (2.5 full-course equivalents) - Ecology 413, 425, 429, 439, 501

3 units (0.5 full-course equivalent) - Either Ecology 417 or 419

6 units (1.0 full-course equivalent) - Options from the Field

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

30 units (5.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Required Courses - Honours Program

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biology 315

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

3 units (0.5 full-course equivalent) - Biology 401

15 units (2.5 full-course equivalents) - Ecology 413, 425, 429, 439, 501

3 units (0.5 full-course equivalent) - Either Ecology 417 or 419

6 units (1.0 full-course equivalent) - Options from the Field

6 units (1.0 full-course equivalent) - Ecology 530

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

24 units (4.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Suggested Program Sequence

Third Year	
Ecology 417 or 429	Biology 401
Ecology 425	Ecology 419 or 439
Ecology 413	Option
Option	Option
Non-science option	Non-science option
Fourth Year	
Ecology 530 (for Honours), option (for Majors)	Ecology 530 continued (for Honours), option (for Majors)
Ecology 417 or 429	Ecology 419 or 439
Option	Ecology 501
Option	Option
Option	Option

Ecology Co-operative Education

Application deadline: December 1 or May 1.

See the subsection on Co-operative Education/Internship Programs in Section 3 (Faculty Regulations) and the major section on "Co-operative Education/Internship" of this Calendar.

Co-operative Education programs are five-year degree programs that include 12 to 16 months of supervised work experience in various industrial and government workplaces. Minimally, students must be in their second year in the Biological Sciences program with a grade point average of 2.30 before applying for admission to the BSc Ecology Co-operative Education program. A grade point average of 3.30 is required for entry into the BSc Honours Ecology Co-operative Education program. In addition, students must complete the courses outlined for the second year of the Ecology program with the same minimum grade point average before commencing the first co-operative education placement (the summer following second year).

Required Courses

120 units (20.0 full-course equivalents) - Same as Ecology Majors or Honours

12 months - Co-operative Education work terms (Co-operative Education 543.01, 543.02, 543.03)

Work Term Assessment

The mandatory work term courses, Co-operative Education 543.01, 543.02, 543.03 and the additional course, Co-operative Education 543.04, are graded on a credit (CR) or fail (F) basis. A positive assessment requires satisfactory performance on each of the following items:

(a) The Co-operative Education Co-ordinator's evaluation of job performance, which is based on an on-site visit where practical.

(b) The employer's evaluation of job performance.

(c) The student's self-assessment of job performance and the overall job experience, which is normally based on participation in a debriefing or integrative session.

(d) A work term report prepared by the student and evaluated by the Faculty.

Notes:

- The Faculty may approve registration in Co-operative Education 543.04 in conjunction with an extra (fourth) work term.

- All courses in the common second-year program must be completed prior to the start of the first work term.
- Students should consult the Ecology Co-op Co-ordinator and Co-operative Education and Internship Co-ordinator for program planning.

5.1.6 Programs in Plant Biology

See the Faculty of Science subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Courses constituting the field of Plant Biology

- Biology 241, 243, 311, 313, 315, 331, 371, 401, 435, 451, 453, 505, 619
- Biochemistry 393, 443, 561
- Cellular, Molecular and Microbial Biology 411, 451, 461, 511, 519, 523, 543
- Ecology 413, 425, 419
- Marine Science 420, 500*, 501*, 502*, 507*, 525
- Certain Medical Science courses**
- All courses labelled Plant Biology
- Certain 600-level courses may be considered to fulfill program requirements. Consult the department for further information.

**Applicability to the field depends upon the actual course content. Approval will have to be granted on an individual basis. Check the list published by the Department each February.*

***No more than 6 units (1.0 full-course equivalent) of such courses (approved by the Department prior to registering in the course) can be counted towards the Major Field.*

Required Courses - Major Program

See also 3.4 Program Requirements, in particular, the regulations on the distribution of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

15 units (2.5 full-course equivalents) - From Biology 435, 453, Plant Biology 327, 401, 403, 421, 543

6 units (1.0 full-course equivalent) - From Biochemistry 561, Biology 451, 505, Plant Biology 541

6 units (1.0 full-course equivalent) - Options from the Field

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

30 units (5.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Required Courses - Honours Program

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Computer Science 217 and 219, or Computer Science 231 and 233, or 235 and Computer Science option

or

Geology 201 and one of 202 or 203

or

Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

15 units (2.5 full-course equivalents) - From Biology 435, 453, Plant Biology 327, 401, 403, 421, 543

6 units (1.0 full-course equivalent) - From Biochemistry 561; Biology 451, 505; Plant Biology 541

6 units (1.0 full-course equivalent) - Options from the Field

6 units (1.0 full-course equivalent) - Plant Biology 530

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

24 units (4.0 full-course equivalents)- Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Suggested Program Sequence

Third Year	
Plant Biology 403 or 421	Plant Biology 401
Option	Plant Biology 327
Option	Option
Option	Option
Non-science option	Non-science option
Fourth Year	
Plant Biology 530 (for Honours), option from Field (for Majors)	Plant Biology 530 continued (for Honours), option from Field (for Majors)
Biology 435 or Plant Biology 541	Plant Biology 543
Option	One of: Biochemistry 561 or Biology 451 or 505 or option
Option	Option
Option	Option

5.1.7 Programs in Zoology

See the Faculty of Science subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and Program Details in Section 5.

Courses constituting the field of Zoology

- Biology 241, 243, 311, 313, 315, 331, 371, 401, 451, 501, 503, 591
- Biochemistry 393, 443, 547
- Cellular, Molecular and Microbial Biology 403, 411, 461, 527
- Ecology 425, 527
- All courses in the Calendar labelled Zoology except Zoology 269
- Marine Science 321, 430, 440, 450, 451, 500*, 501*, 503*, 507*, 502*, 515, 537, 540, 544, 546, 572, 574, 582
- Certain Medical Science courses**
- Neuroscience 401, 411, 531, 541***
- Psychology 478, 531***
- Certain 600-level courses may be considered to fulfill program requirements. Consult the department for further information.

**Applicability to the field depends upon the actual course content. Approval will have to be granted on an individual basis. Check the list published by the Department each February.*

***No more than 6 units (1.0 full-course equivalent) of such courses (approved by the Department prior to registering in the course) can be counted towards the Major Field.*

****No more than 3 units (0.5 full-course equivalent) from this group of courses may be counted towards the Major Field.*

Required Courses - Major Program

See also 3.4 Program Requirements, in particular, the regulations on the number of courses at the 200 level and above allowed in a program and on the List of Science-Equivalent Courses in Other Faculties (Table I).

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223; or Geology 201 and one of 202 or 203

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) – Zoology 375

3 units (0.5 full-course equivalent) - Zoology 377 or 379

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

9 units (1.5 full-course equivalents) - Biology 315, Zoology 461, 463

3 units (0.5 full-course equivalent) - Cellular, Molecular and Microbial Biology 403

6 units (1.0 full-course equivalent) - Chosen from Biology 401 or any courses labelled Zoology at the 400 level or above (excluding Zoology 461 and 463)

3 units (0.5 full-course equivalent) - Options from the Field at the 400 level or above

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

30 units (5.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Required Courses - Honours Program

18 units (3.0 full-course equivalents) - Biology 241, 243, 311, 313, 331, 371

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

6 units (1.0 full-course equivalent) - One of Mathematics 249 or 265 or 275 and one of Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223; or Geology 201 and one of 202 or 203

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) – Zoology 375

3 units (0.5 full-course equivalent) - Zoology 377 or 379

3 units (0.5 full-course equivalent) - Chemistry 351

3 units (0.5 full-course equivalent) - Chemistry 353 or option

9 units (1.5 full-course equivalents) - Biology 315, Zoology 461, 463,

3 units (0.5 full-course equivalent) - Cellular, Molecular and Microbial Biology 403

6 units (1.0 full-course equivalent) - Chosen from Biology 401 or any courses labelled Zoology at the 400 level or above (excluding Zoology 461 and 463)

6 units (1.0 full-course equivalent) - Zoology 530

3 units (0.5 full-course equivalent) - Options from the Field at the 400 level or above

18 units (3.0 full-course equivalents) - Breadth requirement: Options from outside the Faculty of Science*

24 units (4.0 full-course equivalents) - Options

**These 18 units (3.0 full-course equivalents) options are selected from Faculties outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must select at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see 3.4.A.(d) Breadth requirement in Section 3 Faculty Regulations).*

Suggested Program Sequence

Third Year	
Zoology 461	Biology 315
Cellular, Molecular and Microbial Biology 403	Zoology 463
Option	Zoology 375 or 379
Option*	Option
Non-science option	Non-science option
*It is highly recommended that students take Biochemistry 443	
Fourth Year	
Zoology 530 (for Honours), option (for Majors)	Zoology 530 continued (for Honours), option (for Majors)
Option	Option
Option	Option
Option	Option
Option	Option

5.1.8 Environmental Science - Biological Sciences Concentration

Students may pursue a BSc program in Environmental Science with a concentration in Biological Sciences. This is a single degree, four year program offered by the Faculty of Science with collaboration from the Faculty of Arts. Program details are listed in 5.6 Non-Departmental Programs. Since this is a multidisciplinary program with restricted entry, students should consult the Director of the Environmental Science program at their earliest opportunity.

5.1.9 Double Major in the Department of Biological Sciences

Programs with two Major Fields in the Department of Biological Sciences may be completed in the following manner:

- The minimum requirements for both Major Fields must be fulfilled.
- For all programs the following courses will be counted towards both Majors if they are allowed as a major field option: Biology 241, 243, 311, 313, 315, 331 and 371 and Biochemistry 393 and 443.
- For all Major Fields in the Department of Biological Sciences, no course beyond those specified above will be counted towards both Major Fields. If a course constitutes a requirement in both Major Fields, it will be counted towards only one and a substitution must be made to fulfill the requirements of the other Major Field.
- It is not possible to combine the Biological Sciences Major with any other program offered by the Department into a Double-Major program.

For further details consult the Office of Student Affairs, Department of Biological Sciences.

5.1.10 Minor in Biological Sciences

The requirements for a Minor in Biological Sciences are:

- 6 units (1.0 full-course equivalent) - Biology 241 and 243
- 24 units (4.0 full-course equivalents) - Courses constituting the field of Biological Sciences at the 300 level or higher but must include at least one of Biology 311, 313, 331, and 371

The 24 units (4.0 full-course equivalents) may include a maximum of 3 units (0.5 full-course equivalent) from the field of Biological Sciences offered by departments other than the Department of Biological Sciences.

Notes:

- This Minor is available only to students who are not majoring in the Department of Biological Sciences or are not Environmental Science or Natural Sciences concentrators in Biological Sciences or BHSc majors in Biomedical Sciences or Bioinformatics or majors in the Neuroscience program. This is the single minor program offered by the Department and none of the other programs exist as Minors. Students must be aware that preference in enrolment in many courses offered by the Department of Biological Sciences is given to Majors or Environmental Science or Natural Sciences Concentrators within the Department.
- No more than 3 units (0.5 full-course equivalent) approved Medical Sciences courses can be counted towards the Minor Field.

5.2 Chemistry

Degrees Offered*

Undergraduate Programs**	Core	Enhancements
Applied Chemistry	BSc Co-op	BSc Co-op Honours
Chemistry	BSc	BSc Honours
Chemical Physics[1]	BSc Honours	

**There are many options for graduate studies leading to MSc and PhD degrees in the area of Chemistry. Details of graduate specializations can be found in the graduate section of this calendar.*

***All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Program to develop a degree completion plan.*

[1]The BSc Honours program in Chemical Physics is undergoing review. Students interested in this program should seek advice from a program advisor in the Undergraduate Science Centre. Students interested in this area should consider completing a double degree or minor.

Programs Offered

BSc in Chemistry

BSc Honours in Chemistry

BSc in Applied Chemistry Co-operative Education

BSc Honours in Applied Chemistry Co-operative Education

BSc Honours in Chemical Physics

Minor in Chemistry

Departmental vs. Faculty Regulations

Programs in the Department of Chemistry are governed by a combination of general Faculty of Science regulations and the additional program specific regulations listed below.

It is essential for students to be familiar with both sets of regulations. It is helpful to read the Faculty Regulations in Section 3 first.

Students should consult the Degree Navigator periodically to ensure that requirements are being met. Also, students are strongly urged to consult the Department at all stages of their program.

Departmental Information

Department Office: Science A 229

Telephone: 403.220.5340

Phone: 403.220.5353

Fax: 403.284.1372

Website: chem.ucalgary.ca/

Email: chem.undergrad@ucalgary.ca

Enrolment Limitations

Enrolment Limitations in Programs

Due to limited enrolment capacity in many senior courses in which there is a laboratory component, the Chemistry programs have a maximum capacity. For details on entry to the programs, see Section 3 (Faculty Regulations).

Enrolment Limitations in Courses

Enrolment in many courses offered by the Department of Chemistry is limited by laboratory space or other pedagogical considerations. The following courses are available in the first instance only to those students in good standing who meet the prerequisite(s) and have been admitted into a major or Natural Sciences program concentration that requires the course(s): Chemistry 311, 315, 321, 331, 333, 351, 353, 355, 371, 373, 453, 471, 515, 535 and 555.

Consult the Schedule of Classes for details regarding enrolment in these courses.

International Exchange

Students in Chemistry programs have the opportunity to study abroad through participation in a Departmental international exchange scheme/arrangement. For further details please contact the International Student Programs Co-ordinator for Science in Science B 149.

5.2.1 Programs in Chemistry

Admission

See also 3.2 Admission.

Courses constituting the field of Chemistry

- All courses labelled Chemistry except Chemistry 209, 301, 357, 409, and 579
- Biochemistry 341, 393 and 443

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses)

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 (recommended) and Chemistry 203 or 213 (recommended)

6 units (1.0 full-course equivalent) - Physics 211 or 221 or 227 and 223

3 units (0.5 full-course equivalent) - Mathematics 249; or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

36 units (6.0 full-course equivalents) - Chemistry 311, 315, 331, 333, 351, 355 or 353, 371, 373, 453, 471, 531 or 533, Biochemistry 341 or 393

15 units (2.5 full-course equivalents) - From the field of Chemistry of which at least 1.5 full-course equivalents), in addition to Chemistry 531 or 533, must be 500-level courses

3 units (0.5 full-course equivalent) - Physics 255 or 323

6 units (1.0 full-course equivalent) - Mathematics 211 or 213 and 331

3 units (0.5 full-course equivalent) - Science 311

15 units (2.5 full-course equivalents)- Breadth requirement: Options selected from Faculties other than the Faculty of Science. Students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.

(check Table I in Section 3. Faculty Regulations for ineligible courses)

24 units (4.0 full-course equivalents) - Options

Required Courses - Honours Chemistry

The same as in the Major program except that the 24 units (4.0 full-course equivalents) Options are replaced by

6 units (1.0 full-course equivalent) - Chemistry 502

3 units (0.5 full-course equivalent) - any Chemistry course at the 500 level (or above) or any other senior Science courses by the consent of the Department

15 units (2.5 full-course equivalents) - Options

Required Courses - Minor in Chemistry

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 and 203 or 213

12 units (2.0 full-course equivalents) - Chemistry 311, 331, 351 and 371 or 373

12 units (2.0 full-course equivalents) - Courses from the field of Chemistry at the 300 level or above

Note: Chemistry 371 and 373 have Physics and Mathematics prerequisites; see the course descriptions for more details.

Recommendations

Science 311 is limited in enrolment. Students may complete it in either the Fall or Winter Term as dictated by the course capacities.

Chemistry 515 is strongly recommended for students planning careers in analytical or environmental chemistry.

Suggested Program Sequences

(a) Major Program

First Year	
Chemistry 211	Chemistry 213
Physics 211 or 221 or 227	Physics 223
Mathematics 249 or 265 or 275	Mathematics 267 or 277
Option	Option
Non-science option	Non-science option
Second Year	
Chemistry 311	Chemistry 315
Chemistry 351	Chemistry 355 or 353
Physics 323 or non-science option	Chemistry 371
Mathematics 211 or 213	Mathematics 331
Science 311	Science 311 or Physics 255 or option
Third Year	
Chemistry 373	Chemistry 471
Chemistry 331	Chemistry 333
Chemistry 453	Biochemistry 341 or 393
Option	Option
Non-science option	Non-science option
Fourth Year	
Chemistry 531 or option	Chemistry 533 or option
Option	Option
Option	Option
Option	Option
Option	Non-science option

(b) Honours Program

As above except that an option chosen from the list under the section called Required Courses - Honours Chemistry replaces one of the options in Third Year, and Chemistry 502 replaces two of the options in Fourth Year.

5.2.2 Programs in Applied Chemistry Co-operative Education

Admission

Students can apply through the Undergraduate Science Centre once they have completed the required courses and achieved the necessary grades. The detailed Co-operative Education program sequence, as well as additional rules and regulations, may be obtained from the Undergraduate Science Centre.

The following courses (or equivalent transfer credits) must be successfully completed or in progress before an application can be made to the Applied Chemistry program. A minimum grade point average of 2.70, using the courses below, is necessary to be eligible to apply. Students interested in Honours Applied Chemistry must additionally meet the Honours qualifications set out in Subsection 3.2 – Honours Programs.

Courses Required for Calculation of Admission GPA:

- Chemistry 201 or 211 and Chemistry 203 or 213

- Chemistry 351 and 355 or 353
- Chemistry 311 and 315
- Chemistry 331 and 333
- Physics 211 or 221 and Physics 227 or 223
- Mathematics 249 or 265 or 275 and Mathematics 267 or 277

In addition, to maintain status in Applied Chemistry, a grade point average of 2.70 must be achieved in each review period for continuation in the BSc program. Any student in an Honours program is subject to the provisions for continuation in an Honours program, Subsections 3.2 and 3.4C.

Courses constituting the field of Applied Chemistry

- All courses labelled Chemistry except Chemistry 209, 301, 357, 409 and 579
- Co-operative Education 503
- Biochemistry 341, 393 and 443

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses)

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 (recommended) and Chemistry 203 or 213 (recommended)

6 units (1.0 full-course equivalent) - Physics 211 or 221 or 227 and 223

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

42 units (7.0 full-course equivalents) - Chemistry 311, 315, 331, 333, 351, 355 or 353, 371, 373, 425, 453, 471, 515, 531 or 533, Biochemistry 341 or 393

12 units (2.0 full-course equivalents) - From the field of Chemistry of which at least 6 units (1.0 full-course equivalent) in addition to Chemistry 515 and 531 or 533 must be 500-level courses

3 units (0.5 full-course equivalent)- Physics 255 or 323

6 units (1.0 full-course equivalent) - Mathematics 211 or 213 and 331

18 units (3.0 full-course equivalents) - Non-science options as follows

(Check Table I in 3.4 Program Requirements for ineligible courses):

3 units (0.5 full-course equivalent) - Science 311*

15 units (2.5 full-course equivalents) - Breadth requirement: Options selected from Faculties other than the Faculty of Science. Students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.

(Check Table I in 3.4 Program Requirements for ineligible courses)

21 units (3.5 full-course equivalents) - Options

12 months - Co-operative Education 503.01, 503.02, 503.03

**Science 311 is limited in enrolment. Students may complete it in either the Fall or Winter Term as dictated by the course capacities.*

Work Term Assessment

The mandatory work term courses, Co-operative Education 503.01, 503.02, 503.03 and the additional course, Co-operative Education 503.04, are graded on a credit (CR) or fail (F) basis. A positive assessment requires satisfactory performance on each of the following items:

(a) The Co-operative Education Co-ordinator's evaluation of job performance, which is based on an on-site visit where practical.

(b) The employer's evaluation of job performance.

(c) The student's self-assessment of job performance and the overall job experience, which is normally based on participation in a debriefing or integrative session.

(d) A work term report prepared by the student and evaluated by the Faculty.

Notes:

- The Faculty may approve registration in Co-operative Education 503.04 in conjunction with an extra (fourth) work term.
- Students should consult the Chemistry Co-op Co-ordinator and Co-operative Education and Internship Co-ordinator for program planning.

Required Courses - Honours Program

The same as in the Major program except that the 15 units (2.5 full-course equivalents) options are replaced by:

- 6 units (1.0 full-course equivalent) - Chemistry 502
- 9 units (1.5 full-course equivalents) - Options

Recommendations

Of the four work terms indicated in the sequence below, three are required.

Suggested Program Sequences

(a) Major Program

First Year		
Chemistry 211	Chemistry 213	
Mathematics 249 or 265 or 275	Mathematics 267 or 277	
Physics 211 or 221 or 227	Physics 223	
Option	Non-science option	
Non-science option	Non-science option	
Second Year		
Chemistry 311	Chemistry 315	Co-operative Education 503.01
Chemistry 331	Chemistry 333	
Chemistry 351	Chemistry 355 or 353	
Science 311 or option	Science 311 or option	
Mathematics 211 or 213	Mathematics 331	
Third Year		
Co-operative Education 503.02	Chemistry 425	Co-operative Education 503.03
	Chemistry 371	
	Biochemistry 341 or 393	
	Physics 255 or option	
	Non-science option	
Fourth Year		
Chemistry 373	Co-operative Education 503.04	
Chemistry 453		
Chemistry 515		
Physics 323 or option		
Non-science option		
Fifth Year		
Chemistry 531 or Option	Chemistry 471	
Option	Chemistry 533 or Option	
Option*	Option*	
Option	Non-science option	
Option	Option	

**Students completing an Honours degree in Applied Chemistry will replace the options in their final year with Chemistry 502.*

5.2.3 Program in Honours Chemical Physics

This program is offered in conjunction with the Department of Physics and Astronomy.

The BSc Honours program in Chemical Physics is undergoing review. Students interested in this program should seek advice from a program advisor in the Undergraduate Science Centre. Students interested in this area should consider completing a double degree or minor.

Admission and Student Standing

Applications to Honours Chemical Physics are accepted:

- Directly from High School into Honours Chemical Physics (see Section 3.2 Admission).
- As space permits, the Honours Chemical Physics will accept students who have completed Chemistry 211 and 213, Applied Mathematics 217 or Mathematics 251 or 249 or 265 or 275 or Mathematics 277, Mathematics 211 or 213, Computer Science 217, Physics 221 or 227 with a grade of "C-" or better in each course and meet the Honours qualifications set out in Subsection 3.2 – Honours programs.
- Additionally, as space permits, application to Honours Chemical Physics will be accepted from students who meet

the Honours qualifications as set out in 3.2 Admission – Honours Programs, and have followed a program consistent with the one set out in the Suggested Program Sequence below.

Notes:

- Any student in an Honours program is subject to the provisions for continuation in an Honours program, Subsections 3.2 and 3.4C.
- GPA requirements for Honours programs

Students in Chemical Physics must present honours-level performance at the academic review completed after each winter semester. Details on the honours review is found in section A.2 of this calendar. After consultation, students who do not qualify for continuation will be moved into either Chemistry or Physics degrees unless they indicate otherwise and meet the admission requirements for their chosen program. Students with a GPA of less than 2.000 are subject to the provisions of 3.7 Student Standing, B. Performance Review, Probationary Status and Dismissal.

Courses Constituting the Field of Chemical Physics

- Chemistry 201, 203, 211, 213, 331, 333, 351, 353, 355, 371, 373, 402, 471, 502, 571, 573, and 575
- Physics 211, 221, 223, 227, 255, 321, 323, 325, 341, 343, 443, 451, 455, 457, 449, 543, 598, 599

Required Courses - Honours Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses)

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 (recommended) and Chemistry 203 or 213 (recommended)

6 units (1.0 full-course equivalent) - Physics 211 or 221 or 227 and 255 or 323

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275*

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 267 or 277*

3 units (0.5 full-course equivalent) - Computer Science 217

21 units (3.5 full-course equivalents) - Chemistry 331, 333, 351, 355 or 353, 371, 373, 471

3 units (0.5 full-course equivalent) - One of Chemistry 571 or 573 or 575

15 units (2.5 full-course equivalents) - Physics 341, 343, 397, 455, 543

6 units (1.0 full-course equivalent) - Chemistry 502 or Physics 598

9 units (1.5 full-course equivalents) - Applied Mathematics 307, 309, 433

3 units (0.5 full-course equivalent) - Physics 381

18 units (3.0 full-course equivalents) - Breadth requirement: Options selected from Faculties other than the Faculty of Science. Students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.

(Check Table I in 3.4 Program Requirements for ineligible courses)

21 units (3.5 full-course equivalents) - Options

**Mathematics 275 and 277 are the recommended sequence of mathematics courses.*

Recommendations

Science 311 is recommended as one of the options.

Suggested Program Sequences

Honours Program

First Year	
Chemistry 211	Chemistry 213
Mathematics 249 or 265 or 275	Mathematics 267 or 277
Mathematics 211 or 213	Computer Science 217
Physics 221 or 227	Physics 255
Non-science option	Non-science option
Second Year	
Chemistry 351	Chemistry 355 or 353
Physics 341	Physics 343
Physics 397	Chemistry 371
Applied Mathematics 307	Applied Mathematics 309
Non-science option	Non-science option
Third Year	
Chemistry 373	Chemistry 471
Chemistry 331	Chemistry 333
Physics 455	Physics 381
Applied Mathematics 433	Option
Non-science option	Non-science option
Fourth Year	
Chemistry 502 or Physics 598	Chemistry 502 or Physics 598
Physics 543	Option or Chemistry 571 or 573 or 575
Option or Chemistry 571 or 573	Option
Option	Option
Option	Option

5.2.4 Environmental Science - Chemistry Concentration

Students may pursue a BSc program in Environmental Science with a concentration in Chemistry. This is a single-degree, four-year program offered by the Faculty of Science with collaboration from the Faculty of Arts. Program details are listed in 5.6 Non-Departmental Programs. Since this is a multidisciplinary program with restricted entry, students should consult the Director of the Environmental Science program at their earliest opportunity.

5.3 Computer Science

Degrees Offered*

Undergraduate Programs	Core	Enhancements	Combined Degrees**
Computer Science	BSc, BA[1]	BSc Honours, BSc Internship, BSc Honours Internship, BA Honours[1]	BSc/BComm[2]

**There are many options for graduate studies leading to MSc and PhD degrees in the area of Computer Science. Details of graduate specializations can be found in the graduate section of this calendar.*

***All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Program to develop a degree completion plan.*

[1]The BA program in Computer Science is undergoing review. Students interested in this program should seek advice from a program advisor in the Undergraduate Science Centre. Many options for diversifying a BSc in Computer Science are available to students.

[2]Combined degree with the Haskayne School of Business.

Programs Offered

BSc and BSc Honours in Computer Science

BA and BA Honours in Computer Science

BSc and BSc Honours in Computer Science Internship

Minor in Computer Science

Department vs. Faculty Regulations

Programs in the Department of Computer Science are governed by a combination of general Faculty of Science regulations and the additional program specific regulations listed below.

It is essential for students to be familiar with both sets of regulations. It is helpful to read the Faculty Regulations in Section 3 first.

Students should consult the Degree Navigator periodically to ensure that requirements are being met. Also, students are strongly urged to consult the Department at all stages of their program.

Department Information

Department Office: Information & Communications Technologies (ICT) 602

Telephone: 403.220.6015

Undergraduate Advisor: Information & Communications Technologies (ICT) 602

Fax: 403.284.4707

Website: cpsc.ucalgary.ca/

Email: cpsc@cpsc.ucalgary.ca

Accreditation

Effective 2001, the BSc and BSc Honours degree programs have been accredited by the Computer Science Accreditation Council (CSAC) for Computer Science programs. Effective 2001, the BSc degree program with Software Engineering Concentration and effective 2006 the BSc Honours with Software Engineering Concentration have been accredited by the CSAC for Software Engineering programs.

The CSAC is sponsored by the Canadian Information Processing Society (cips.ca/). Its mandate is to ensure that accredited programs meet standards for education in Computer Science and Software Engineering.

Students who graduate from an accredited degree program are eligible for the Information Systems Professional (I.S.P.) designation after two years of professional experience. The I.S.P. designation is recognized as a professional designation under provincial law in most Canadian Provinces, including Alberta.

First Courses in Computer Science

The Department of Computer Science offers the following courses for students who are interested in an introduction to the discipline of computer science or who wish to use computers more effectively. Each of Computer Science 217, 231 and 235 is intended primarily for a group of students (with differing academic objectives) who are interested in an introduction to computer science that includes an introduction to programming and that is available for credit in computer science programs. The pace at which programming concepts are introduced also differs in each course.

- Computer Science 217 is recommended for students wishing to combine studies in computer science with studies in other disciplines, or who are in programs other than computer science and who are interested in a course that includes an introduction to programming. Material related to computer science will be introduced at a pace that is appropriate for students who are unfamiliar with programming or scripting. On completion of Computer Science 217, students who are interested in computer science programs would continue by taking Computer Science 219. The latter course includes additional lectures in order to ensure that students in this course sequence are adequately prepared for senior courses in computer science.
- Computer Science 231 is recommended for computer science majors. Material related to computer science will be introduced at a somewhat faster pace than in Computer Science 217. On completion of Computer Science 231, students who are interested in computer science programs would continue by taking Computer Science 233.
- Computer Science 235 is a challenging course intended for exceptional students. This also includes an introduction to programming and it can be used in place of either Computer Science 217 and 219 or Computer Science 231 and 233 in requirements for computer science programs. Students completing Computer Science 235 will have additional flexibility when choosing options in computer science and may be able to complete courses that are required for computer science programs more rapidly than would otherwise be possible.
- Computer Science 203 is recommended for students who are not in computer science programs and who are interested in a course that introduces computer system fundamentals and tools, including spreadsheets, and database applications. This course generally does not include an extensive introduction to programming and it is not available for credit for computer science majors or minors.

Advanced Placement in Computer Science

Students in International Baccalaureate (IB) and Advanced Placement (AP) programs may be eligible for advanced credit in Computer Science courses, including Computer Science 217 and 219 or 231 and 233. See the Undergraduate Admissions section of this Calendar (A.12 Transfer Credit/Advanced Standing) for additional details.

Other students with backgrounds in Computer Science equivalent to Computer Science 231 or 231 and 233 may request advanced placement in Computer Science in order to have prerequisite requirements for these courses waived, after successful completion of an advanced placement examination. Interested students should see the Undergraduate Admissions section of this Calendar (A.12.2 Advanced Placement (AP) Program) for additional details, and contact the Department of Computer Science to apply.

5.3.1 Programs in Computer Science

Admission

See the subsections on Enrolment Limitations in Section 3 (Faculty Regulations) and in Section 5 (Program Details) under Computer Science.

In some cases, courses that are no longer offered can be substituted for newer courses listed in the following requirements. Additional information about course substitutions is available from the Department of Computer Science.

Courses constituting the field of Computer Science

- All courses labelled Computer Science except Computer Science 203;
- Applied Mathematics 491, 493;
- Pure Mathematics 418;
- All courses labelled Software Engineering.

Required Courses - BSc Major Program

6 units (1.0 full-course equivalent) - One of the following three sets of courses:

- Computer Science 231 and 233

- Computer Science 217 and 219
- Computer Science 235 and 3 units (0.5 full-course equivalent) from the field of computer science at the 300 level or above

21 units (3.5 full-course equivalents) - Computer Science 313, 319 or 331, 355, 359, 413, 449 and 457

3 units (0.5 full-course equivalent) - Software Engineering 301

12 units (2.0 full-course equivalents) - One of Mathematics 211 or 213; Mathematics 249 or 265 or 275; one of Mathematics 271 or 273; and one of Statistics 213, 321, or an alternative course in Statistics with the consent of the Department (Statistics 321 is preferred)

3 units (0.5 full-course equivalent) - Logic Requirement: Philosophy 279 or 377

3 units (0.5 full-course equivalent) - Ethics Requirement: Philosophy 314, or an alternative course that includes an introduction to professional ethics with the consent of the Department

24 units (4.0 full-course equivalents) - Taken from the field of Computer Science: 9 units (1.5 full-course equivalents) of these must be numbered 500 or above, 12 units (2.0 full-course equivalents) at the 400 level or above, and 3 units (0.5 full-course equivalent) at the 300 level or above

36 units (6.0 full-course equivalents) - Non-CPSC Requirement: Options that are not in the field of Computer Science

12 units (2.0 full-course equivalents) - Options (see Notes)

Notes:

- Students who complete Computer Science 217 or 231 are only permitted to count a maximum of 6 units (1.0 full-course equivalent) of computer science at the 200-level toward the BSc Major program. Students who complete Computer Science 235 are only permitted to count a maximum of 3 units (0.5 full-course equivalent) of computer science at the 200-level toward the BSc Major program.
- Courses used to satisfy the above Logic Requirement, Ethics Requirement and Non-CPSC Requirement must include at least 9 units (3.0 full-course equivalents) chosen from Faculties other than the Faculty of Science. Of these 9 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts. The 9 units (3.0 full-course equivalents) from other Faculties may not be chosen from the courses listed in Table I in 3.4 Program Requirements.
- Statistics 321 has one of Mathematics 253 or 267 or 277 as a prerequisite.
- Science 311 may be counted among the 9 units (3.0 full-course equivalents) from other Faculties.
- The Department offers several concentrations that can provide focus on specific areas of computer science. Students interested in these concentrations need to choose their options carefully, including the options taken in the first two years of the program, to fulfill the concentration requirements.

Required Courses - BSc Honours Program

6 units (1.0 full-course equivalent) - One of the following three sets of courses:

- Computer Science 231 and 233
- Computer Science 217 and 219
- Computer Science 235 and 3 units (0.5 full-course equivalent) from the field of computer science at the 300 level or above

27 units (4.5 full-course equivalents) - Computer Science 313, 319 or 331, 355, 359, 413, 449, 457 and 502

3 units (0.5 full-course equivalent) - Software Engineering 301

12 units (2.0 full-course equivalents) - One of Mathematics 211 or 213, one of Mathematics 249 or 265 or 275, one of Mathematics 271 or 273, and one of Statistics 213, 321, or an alternate course in Statistics with the consent of the Department (Statistics 321 is preferred)

3 units (0.5 full-course equivalent) - Logic Requirement: Philosophy 279 or 377

3 units (0.5 full-course equivalent) - Ethics Requirement: Philosophy 314, or an alternative course, including an introduction to professional ethics with the consent of the Department

24 units (4.0 full-course equivalents) - Taken from the field of Computer Science: 15 units (2.5 full-course equivalents) of these courses must be at the 500 level or above, and 9 units (1.5 full-course equivalents) at the 400 level or above

24 units (4.0 full-course equivalents) - Non-CPSC Requirement: Options that are not in the field of Computer Science

18 units (3.0 full-course equivalents) - Options (see Notes)

Notes:

- Students who complete Computer Science 217 or 231 are only permitted to count a maximum of 6 units (1.0 full-course equivalent) of computer science at the 200-level toward the BSc Major program. Students who complete Computer Science 235 are only permitted to count a maximum of 3 units (0.5 full-course equivalent) of computer science at the 200-level toward the BSc Major program.
- Courses used to satisfy the above Logic Requirement, Ethics Requirement and Non-CPSC Requirement must include at least 18 units (3.0 full-course equivalents) chosen from Faculties other than the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.
- The 18 units (3.0 full-course equivalents) from other Faculties may not be chosen from the courses listed in Table I in 3.4 Program Requirements.
- Statistics 321 has one of Mathematics 253 or 267 or 277 as a prerequisite.
- Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.
- The Department offers several concentrations that can provide focus on specific areas of computer science. Students interested in these concentrations need to choose their options, including the options taken in the first two years of the program, carefully to fulfill the concentration requirements.

Required Courses - BA Major Program*

**The BA program in Computer Science is undergoing review. Students interested in this program should seek advice from a program advisor in the Undergraduate Science Centre. Many options for diversifying a BSc in Computer Science are available to students.*

This program is available to students wishing to complete a double major with an Arts discipline: They are only open to students who are also registered in a BA program offered by the Faculty of Arts. Students interested in these programs should contact the Department of Computer Science for advice concerning the choice of courses in Computer Science that would complement their studies in Arts.

6 units (1.0 full-course equivalent) - One of the following three sets of courses:

- Computer Science 231 and 233
- Computer Science 217 and 219
- Computer Science 235 and 3 units (0.5 full-course equivalent) from the field of computer science at the 300 level or above

15 units (2.5 full-course equivalents) - Computer Science 319 or 331, 355, 441, 449, and 481

3 units (0.5 full-course equivalent) - Software Engineering 301

9 units (1.5 full-course equivalents) - One of Mathematics 211 or 213, one of Mathematics 249 or 265 or 275, and one of Mathematics 271 or 273

6 units (1.0 full-course equivalent) - Logic Requirement: One of Philosophy 279 or 377 and 379

3 units (0.5 full-course equivalent) - Ethics Requirement: Ethics Requirement: Philosophy 314, or an alternative course that includes an introduction to professional ethics with the consent of the Department

24 units (4.0 full-course equivalents) - Taken from the field of Computer Science: one numbered 500 or above, two numbered 400 or above, and one numbered 300 or above

48 units (8.0 full-course equivalents) - Breadth Requirement: Non-Science options. These courses will make up the Arts component of the students major program but may **not** be chosen from the courses listed in Table I in 3.4 Program Requirements without consent of the Department.

6 units (1.0 full-course equivalent) - Options

Notes:

- Students who complete Computer Science 217 or 231 are only permitted to count a maximum of 6 units (1.0 full-course equivalent) of computer science at the 200-level toward the BA Major Program. Students who complete Computer Science 235 are only permitted to count a maximum of 3 units (0.5 full-course equivalent) of computer science at the 200-level toward the BA Major program.
- Courses used to satisfy the above Logic Requirement, Ethics Requirement and Non-CPSC Requirement must include at least 18 units (3.0 full-course equivalents) chosen from Faculties other than the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.
- Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

Recommendations

- Computer Science 101 and 102 are recommended but not required. These are offered during Block Weeks preceding the beginning of session, but may not be available in all years.
- Students unable to take Philosophy 279 in first year may substitute Philosophy 377 and should take this course in the Fall of second year. Philosophy 379 is not required for a BSc in Computer Science but is recommended. This course is required for a BA in Computer Science.
- A course in technical writing, such as Communications Studies 363 or Science 311, is highly recommended. If no such course is available then any course in which a student's writing will be assessed should be considered.
- Courses offered by the Haskayne School of Business are often a good choice for non-science options for future software developers. Space permitting, and provided the Area Chair and Associate Dean (Undergraduate Affairs) in the Haskayne School of Business have given approval, registration in restricted Business Technology Management (BTMA) courses may be permitted. Consult the Undergraduate Programs Office in the Haskayne School of Business (Scurfield Hall 351) for details.
- To ensure compliancy with CSAC accreditation breadth requirements, students should ensure that they complete five full-course equivalents that are not in computer science or mathematics as part of their degree program, provided that program requirements allow for this course selection.

Recommended Program Sequence BSc (Majors and Honours)

There are many sequences in which courses can be taken in order to complete requirements for the BSc in Computer Science and BSc Honours in Computer Science programs. In general, the following tables simply list one commonly used sequence. For information about alternatives, see the note on "First Courses in Computer Science," above, the preceding list of requirements for whichever Computer Science program is of interest, the above recommendations, and recommendations concerning Mathematics and Statistics courses that are included in the description of Mathematics and Statistics programs.

Students interested in a specific concentration need to choose their computer science, science and non-science options according to the concentration requirements. This includes options taken in years 1 and 2 of the program.

First Year	
Computer Science 101	
Computer Science 231	Computer Science 233
Mathematics 211	Mathematics 271
Required course in Mathematics and Statistics	Required course in Mathematics and Statistics
Philosophy 279	Option
Option	Non-science option
Second Year	
Computer Science 102	
Computer Science 331	Computer Science 313
Computer Science 355	Computer Science 359
Philosophy 314 or option	Software Engineering 301 or Computer Science 301
Option	Philosophy 379 or option
Non-science option	Philosophy 314 or non-science option
Third Year	
Computer Science 413**	Option in the Field of Computer Science
Computer Science 449**	Option in the Field of Computer Science
Computer Science 457**	Option in the Field of Computer Science
Option	Option
Non-science option	Non-science option
Fourth Year	
Computer Science 502 ***	Computer Science 502 ***
Option in the Field of Computer Science	Option in the Field of Computer Science
Option in the Field of Computer Science	Option in the Field of Computer Science
Option	Option in the Field of Computer Science
Option	Option

***Students are encouraged to complete these required 400-level courses in Computer Science as soon as possible. Choice of 500-level options in Computer Science will be limited if this advice is not followed.*

****Computer Science 502 is required for the Honours program. Computer Science Majors interested in a research project should consider Computer Science 503.*

Concentrations

Students may focus their program on one of seven areas of interest by including a specified set of courses, into their Major or Honours degree. Successful completion will mean that the area of concentration will appear on the transcript. The concentrations and course requirements are:

A. Concentration in Computer Game Development

- One of Mathematics 267 or 277 or 283 or Mathematics 331
- One of Physics 211, 221 or 227
- Computer Science 453 and 585
- One of Computer Science 441, 461, or 481
- One of Computer Science 587, 589, or 591
- One of Computer Science 433, 531, or 535
- 6 units (1.0 full-course equivalent) selected from:
  - Art 231, 233, 241, 243, 339 and 349
  - Drama 223 and 225
  - English 265, 393, 395, or 399
  - Communications Studies 201
  - Operations Management 301
  - Music 209, 211, 213, 225, 309, 325, 329, 351, 451, 453, 511, 513, 551 or any Music course listed as formerly Music Theory and Composition

Note: Students interested in taking courses offered by the Department of Art to complete these requirements are encouraged to contact that department for permission to enrol in courses normally restricted to BFA Art students.

B. Concentration in Software Engineering

- Software Engineering 403
- Computer Science 594 or 502.06, or Computer Science 503.06 plus 3 units (0.5 full-course equivalents) chosen from courses labelled Software Engineering
- Computer Science 481

C. Concentration in Theoretical Computer Science

- 18 units (3.0 full-course equivalents) chosen from Mathematics 311, 313, Statistics 321, Philosophy 379, Computer Science 411, 418, 491, 502.02, 503.02, 511, 513, 517, 518, 519, 521, 522, 530, 561 or Pure Mathematics 527, of which, a maximum of 6 units (1.0 full-course equivalent) may be at the 300 level.

Note: Honours students interested in Algorithms and Complexity Theory should consider the use of Computer Science 502.02 to complete the Honours requirement for Computer Science 502.

D. Concentration in Scientific Computation*

- One of Mathematics 267 or 277
- 3 units (0.5 full-course equivalent) of courses labelled Mathematics or Statistics 300-level or above
- Computer Science 471 and 491
- 9 units (1.5 full-course equivalents) chosen from Computer Science 453, 461, 531, 535, 559, 571, 572, 583, 599* and 601*, of which, a maximum of 3 units

(0.5 full-course equivalent) may be at the 400-level

- One of Biology 311, 313, 371, Marine Science 321, Plant Biology 327, 403, 421, Zoology 375, Chemistry 311, 331, 351, 371, 373, 402.01, Physics 325, 343, 375, 455, Astrophysics 307, 409, Geology 313, 323, 337, 343, 353, 381, 401, 475, Geophysics 351, 355, or 453. All of these courses require a minimum of 6.0 units (1.0 full-course equivalent) of prerequisite courses. Student should identify the prerequisite courses needed for the course they intend to complete from this list. Junior level prerequisite courses should be incorporated into students' first year of studies. Students may contact the Undergraduate Science Centre (USC) for assistance in planning their course work in order to fulfil this requirement.

Note: Honours students interested in Scientific Computation should consider the use of Computer Science 502.05 to complete the Honours requirement for Computer Science 502.

**Students interested in using Computer Science 599 or 601 should contact the department to determine which topics, if any, are being offered in a given year that may be used to fulfill the requirements of this concentration.*

E. Concentration in Human-Computer Interactions

- Computer Science 481
- 6 units (1.0 full-course equivalent) chosen from Computer Science 581 (recommended), 583 or 584
- One of Computer Science 453, 502.07, 503.07, 581, 583, 584, Software Engineering 403, 471 or 515 that is not already being used to meet another concentration requirement
- 6 units (1.0 full-course equivalent) chosen from:
  - Anthropology 203
  - Art 317, 321, 331, 334, 399, 401, 431, or 491
  - Communications Studies 201 or 481
  - Innovation 321 or 323
  - Museum and Heritage Studies 201
  - Psychology 200, 201, 203, 312, 365, or 369
  - Sociology 201, 311, 313, 315, 341, or 345

Notes:

- Honours students interested in Human-Computer Interactions should consider the use of Computer Science 502.07 to complete the Honours requirement for Computer Science 502.
- Students interested in taking courses offered by the Department of Art to complete these requirements are encouraged to contact that department for permission to enrol in courses normally restricted to BFA Art students.

F. Concentration in Computer Graphics

- One of Mathematics 267 or 277
- Computer Science 453
- Two of Computer Science 587, 589 and 591
- Two of Computer Science 481, 535, 585, 587, 589, 591 or 599*, that are not already being used to meet another concentration requirement
- One of Art 231, 233, 241, 339, 349, Physics 211, 221, or 227

Notes:

- Honours students interested in Computer Graphics should consider the use of Computer Science 502.03 to complete the Honours requirement for Computer Science 502.
- Students interested in taking courses offered by the Department of Art to complete these requirements are encouraged to contact that department for permission to enrol in courses normally restricted to BFA Art students.

**Students interested in using Computer Science 599 should contact the department to determine which topics, if any, are being offered in a given year that may be used to fulfill the requirements of this concentration.*

G. Concentration in Information Security

- Computer Science 329, 441, 525 and 526
- Either Computer Science 418 or Pure Mathematics 418
- One of Computer Science 502.04, 503.04, 527, 528, 530 or Software Engineering 521

Note: Honours students interested in Information Security should consider the use of Computer Science 502.04 to complete the Honours requirement for Computer Science 502. Computer Science 418 is recommended over Pure Mathematics 418.

H. Concentration in Networks and Distributed Computing

- Computer Science 329
- Computer Science 441
- Computer Science 559 or 561
- One of Computer Science 525, 526, 528 or 530
- One of Computer Science 502.08 or Computer Science 503.08
- One of Software Engineering 513, Computer Science 550, 567, 568 or 571

Note: Computer Science 526 is recommended over Computer Science 525, 528 or 530.

5.3.2 BSc Major and Honours in Computer Science Internship Programs

The Internship programs in Computer Science are five-year (120 units or 20 full-course equivalents) degree programs that include a 12- or 16-month Internship period of supervised work experience.

Before starting their first Internship work period, students must meet the admission requirements specified in the Co-operative Education/Internship section of this Calendar. In addition, students must be Computer Science majors or Computer Science honours students, and must currently be taking and/or have completed between 90 and 105 units (15 and 17.5 full-course equivalents) appropriate to their degree program, including:

(a) Computer Science 313, 319 or 331, 355, 359 and Software Engineering 301 (or Computer Science 301)

(b) At least one of Computer Science 349 or 449, 413 or 457

(c) Philosophy 279 or 377

(d) An additional 18 units (3.0 full-course equivalents) in the field of Computer Science, including 15 units (2.5 full-course equivalents) numbered 400 or above, and 3 units (0.5 full-course equivalents) numbered 300 or above.

Students should have a minimum grade point average of 2.50 calculated over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) at the time of application to the Internship Major program. Honours students in good standing at time of application will be admitted to the Internship Honours program.

Students who are very close to these admission criteria are also encouraged to apply; admission will be decided on a case by case basis.

Students must apply to the Undergraduate Science Centre prior to completing the admission requirements outlined above, and by the dates given below. Transcripts must show that the student is enrolled in any courses necessary to complete the admission requirements. Application dates are:

- October 1 for a May 1 first Internship placement
- May 1 for a September 1 first Internship placement
- May 1 for a January 1 first Internship placement

Requirements

Students in the BSc in Computer Science Internship program must meet all requirements for the BSc Major in Computer Science degree program. Students in the BSc Honours in Computer Science Internship program must meet all requirements for the BSc Honours in Computer Science program.

In addition to the above requirements, students must complete the following three courses (which represent the individual Internship work terms):

- Internship 503.01, 503.02, and 503.03 (Internship 503.04 is recommended but not required.)

Students must take all their Internship work terms consecutively and be registered full-time. Upon completion of each Internship work term, the student must present a work term report to the Department of Computer Science Internship Representative. Reports and work terms are evaluated on a CR/F grade, based on job performance and completion of a work term report that meets the standards of the Department of Computer Science. Students should also be aware of the policy concerning course withdrawal, as specified in the Co-operative Education/Internship section of this Calendar.

For further details and information, see the Department of Computer Science website (cpsc.ucalgary.ca/undergrad/internship/).

Work Term Assessment

The mandatory work term courses, Internship 503.01, 503.02 and 503.03 and the additional course, Internship 503.04, are graded on a credit (CR) or fail (F) basis. A positive assessment requires satisfactory performance on each of the following items:

(a) The Internship Co-ordinator's evaluation of job performance, which is based on an on-site visit where practical.

(b) The employer's evaluation of job performance.

(c) The student's self-assessment of job performance and the overall job experience, which is normally based on participation in a debriefing or integrative session.

(d) A work term report prepared by the student and evaluated by the Faculty.

Notes:

- The Faculty may approve registration in Internship 503.04.
- Students should consult the Computer Science Internship Co-ordinator and Co-operative Education and Internship Co-ordinator for program planning

Program Sequence

The Internship period, consisting of the consecutive Internship 503.01, 503.02, 503.03 and optional 503.04 Internship work terms, is normally taken shortly after completing the required courses as indicated above. This typically occurs after year three (minimum 90 units or 15.0 full-course equivalents) but before completing year four (maximum 105 units or 17.5 full-course equivalents).

The combination of Internship and study sessions will allow completion of the program in five years.

5.3.3 Combined Degree Programs

Please see 3.4 Program Requirements of the Faculty of Science section of the Calendar concerning programs that combine studies in multiple disciplines – including Double Major and Double Honours programs, Combined Degree Programs within the Faculty of Science, and Combined Degree Programs with other Faculties. Combinations involving Computer Science and another Discipline that are commonly pursued include:

- A Double Major or Combined degree programs with those offered by the Department of Mathematics and Statistics.
- A Combined Program with another Science discipline – notably with Biological Science.
- A Combined Program leading to a BComm degree (offered by the Haskayne School of Business) and to a BSc in Computer Science.

Requirements for such programs are often extremely tight. Please consult the Department of Computer Science for advice about course selections if you are interested in these or other program combinations.

5.3.4 Required Courses - Minor Program

- 6 units (1.0 full-course equivalent) - One of the following three sets of courses:
  - Computer Science 217 and 219
  - Computer Science 231 and 233
  - Computer Science 235 and 3 units (0.5 full-course equivalent) in the field of Computer Science at the 300 level or above
- 3 units (0.5 full-course equivalent) - Computer Science 319 or 331
- 21 units (3.5 full-course equivalents) - Taken from the field of Computer Science of which 15 units (2.5 full-course equivalents) must be numbered 300 or above, and 6 units (1.0 full-course equivalent) must be numbered 400 or above

Note: Many senior courses in Computer Science have prerequisites in other disciplines, especially in Mathematics and Statistics.

5.4 Geoscience

Degrees Offered*

Undergraduate Programs**	Core	Enhancements
Applied and Environmental Geology[1]	BSc	BSc Honours
Geology	BSc	BSc Honours
Geophysics	BSc	BSc Honours

**There are many options for graduate studies leading to MSc and PhD degrees in the area of Geosciences. Details of graduate specializations can be found in the graduate section of this calendar.*

***All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Program to develop a degree completion plan.*

[1]The Applied and Environmental Geology program will be suspended as of Fall 2015. Students interested in this degree are encouraged to apply for the Geology program and speak to a program advisor in the USC for their degree planning.

Programs Offered

BSc and BSc Honours in Geology, Geology (Petroleum Geology Concentration), Applied and Environmental Geology, and Geophysics

Minors in Geology and Geophysics

Double Major and Double Degree Programs

- Double major programs are allowed combining any two of: (i) Geology or Geology (Petroleum Geology Concentration), (ii) Applied and Environmental Geology, (iii) Geophysics, (iv) Earth Science, (v) Environmental Science (Geology).
- Double degree programs are allowed combining Geophysics with one of (i) Geology, (ii) Geology (Petroleum Geology Concentration), (iii) Applied and Environmental Geology, (iv) Environmental Science (Geology).

Department vs. Faculty Regulations

Programs in the Department of Geoscience are governed by a combination of general Faculty of Science regulations and the additional program specific regulations stated in the following sections.

It is essential for students to be familiar with both sets of regulations. It is helpful to read the Faculty Regulations in Section 3 first.

Students should consult the Degree Navigator periodically to ensure that requirements are being met. Also, students are strongly urged to consult the Department and the Undergraduate Science Centre at all stages of their program.

APEGA Requirements

The practice of geology and geophysics in Alberta is governed by Provincial law and regulated by the Association of Professional Engineers and Geoscientists of Alberta (APEGA). Members of the Rundle Group and the Geophysics Society are automatically student members of APEGA.

In order to meet the requirements of professional registration, specific academic training and four years of appropriate full-time experience as a geologist- or geophysicist-in-training following graduation are needed.

The Majors and Honours BSc programs in Geology, Geology (Petroleum Geology Concentration), Applied and Environmental Geology, and Geophysics, whose course requirements are stipulated in sections 5.4.1 - 5.4.4, meet the current academic requirements for professional registration with APEGA, if the appropriate options are taken (see the Notes in the Required Courses subsections in sections 5.4.1 - 5.4.4). These academic requirements are available on the APEGA website: apega.ca, and on the Department website (see below).

Department Information

Department Office: Earth Sciences 118

Telephone: 403.220.5841

Fax: 403.284.0074

Website: ucalgary.ca/geoscience

Email: geoscience@ucalgary.ca

Enrolment Limitations

Program Enrolment Limits

1. The Department of Geoscience limits enrolment in all programs. Students may be directly admitted into the Geology, Applied and Environmental Geology, or Geophysics programs. Students may also apply to transfer into the Geology (Petroleum Geology Concentration) program after completion of 30 units (5.0 full-course equivalents). As space permits, the Department will accept a certain number of students who wish to gain admission to the Department's programs by transferring from other institutions or programs. Any student requesting admission at this level is subject to section A.2 of the Undergraduate Admissions section of this Calendar. In the event that the number of students choosing any of these programs exceeds the number that can be accommodated by available resources, students will be admitted to that program in descending

rank order of academic performance until the enrolment limit is reached.

2. Admission will be granted for Fall Term only and will be based upon academic merit. Due to limited enrolment capacity in many senior courses, it may not always be possible to accommodate every student's choice of optional geology courses in the third and subsequent years.

Course Enrolment Limitations

Many of the second-, third- and fourth-year courses in Geology and Geophysics are limited-enrolment courses, and priority for enrolment is given to students registered in one of the following programs: Geology, Geology (Petroleum Geology Concentration), Applied and Environmental Geology, Geophysics, Environmental Science (Geology Concentration), Natural Sciences (Geoscience Concentration), Earth Science.

5.4.1 Programs in Geology

Admission

See the sections on Enrolment Limitations under the Department of Geoscience and under Section 3 (Faculty Regulations).

Courses constituting the field of Geology

- All courses labelled Geology excluding Geology 209, 301, 305, 307, 309, 377, 471

Geology Program Streams*

Students may focus their studies by following the Hydrogeology/Environmental Geoscience stream or the Solid Earth Geoscience stream. This entails choosing appropriate options, as outlined in the Required Courses – Major Program Section. More information can be found on the Department of Geoscience website.

**A stream is not a separate program, but rather a route or a suggested sequence of courses within the Geology program that students should take to focus their studies in a certain area.*

Required Courses - Major Program

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Degree Programs) and 3.5B (Introductory Courses for Science Degree Programs).

33 units (5.5 full-course equivalents) - Geology 201; 202 or 203; 313 or 423; 323; 333 or 311; 337; 343 or 341; 353 or 373; 381; 445; 493 or 491

- Students who have taken Geology 341 (discontinued) do not need to take, and may not receive credit for, either Geology 343 or 445. For these students, Geology 341 replaces Geology 343 and Geology 445 must be replaced with another 3 units (0.5 full-course equivalent) option from the field of Geology.

3 units (0.5 full-course equivalent) - Geophysics 351

21 units (3.5 full-course equivalents) – Options from the field of Geology

- Students interested in the Hydrogeology/Environmental Geoscience stream are advised to take Geology 401 and 403 (foundational courses), followed by one or more recommended options. Recommended options that require Geology 401 and 403 and/or other 400-level courses are Geology 441, 505, 537. Other recommended options are Geology 435, 475, 571, 597.
- Students interested in the Solid Earth Geoscience stream are advised to take Geology 431 and 433 (foundational courses), followed by one or more recommended options. Recommended options that require Geology 431 and 433 and/or other 400-level courses are Geology 527, 535, 537, 543, 555. Other recommended options are Geology 435, 523, 541.
- To meet APEGA Geology requirements, students should satisfy either (a) or (b):
  (a) take one of Geology 431, 433, 463, 483
  (b) take both Geology 401 and 571

6 units (1.0 full-course equivalent) - Geology, Geophysics or Engineering (GGE) options from the following (see Notes):

- Petroleum Engineering 507, 513, 515, 523, 525, 533, 543, 563, 573
  - A maximum of two of these may be counted towards APEGA Geology requirements. Students are advised to take ENPE 523 first, and to take it in the Fall Term.
- Courses in the fields of Geology and Geophysics
  - Recommended geophysics options for students interested in the Hydrogeology/Environmental Geoscience stream: Geophysics 355, 565.
  - Recommended geophysics options for students interested in the Solid Earth Geoscience stream: Geophysics 355, 453.

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 253 or 267 or 277

3 units (0.5 full-course equivalent) - Mathematics 211

3 units (0.5 full-course equivalent) - Science 311

6 units (1.0 full-course equivalent) - Science options from the following (see Notes):

- Applied Mathematics 311, 413, 415
- Biology 205, 241, 243
- Chemistry 311, 315, 321, 331, 333, 351, 353, 371*, 373*
- Computer Science 217 or 231 or 235, Computer Science 219 or 233
- Mathematics 311, 331*, 349, 353, 367, 375, 377
- Physics 321*, 323*, 325
- Statistics 205 or 213 or 321 or 327*
- Zoology 375

**Recommended options*

15 units (2.5 full-course equivalents) - Breadth requirement: Non-science options (see Notes)

12 units (2.0 full-course equivalents) - Options (Science options are recommended -- see Notes)

Notes:

- The Major program may contain a maximum of 66 units (11.0 full-course equivalents) from the field of Geology, and the Honours program may contain a maximum of 78 units (13.0 full-course equivalents) from the field of Geology.
- The Major and Honours programs must contain at least 9 units (1.5 full-course equivalents) at the 500 level or above from the field of Geology.
- 600-level courses are available to fourth year students with prerequisites and consent of the Department.
- In order to meet the academic requirements for registration with APEGA, 6 units (1.0 full-course equivalent) from the Science Options and/or the Options must be chosen from one or more of biology, chemistry (3 units or 0.5 full-course equivalent maximum), computer science, physics (3 units or 0.5 full-course equivalent maximum), or statistics.
- These 15 units (2.5 full-course equivalents) and Science 311 form the 18 units (3.0 full-course equivalents) non-science course requirements selected from Faculties other than the Faculty of Science (see Table I, 3.4 Program Requirements for courses that may not be used to satisfy this requirement). Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see (d) Breadth requirement in 3.4 Program Requirements.

Required Courses - Honours Program

Same as the Major degree program in Geology except that the Honours program must include:

- 6 units (1.0 full-course equivalent) - Geology 510
- 3 units (0.5 full-course equivalents) - Geophysics 355 or 453 or 565

Required Courses - Minor Program

30 units (5.0 full-course equivalents) in the field of Geology

Suggested Program Sequence (Majors and Honours)

First Year	
Geology 201	Geology 202
Chemistry 201 or 211	Chemistry 203 or 213
Mathematics 249 or 265 or 275	Mathematics 267 or 277
Physics 211 or 221	Physics 223
Non-science option	Non-science option

Second Year	
Geophysics 351	Geology 323
Geology 313***	Geology 333
Geology 381	Geology 343
Mathematics 211 or 221	Geology 353
Science 311	Non-science option
Third Year	
Geology 337*	Geology 493
Geology 445	Geology option
Geology option	Geology option
Geology option	Science option
Non-science option	Non-science option
Fourth Year	
Geology option	Science option
GGE option** (for Majors); Geophysics 355 or 453 or 565 (for Honours)	GGE option**
Geology option (for Majors) or Geology 510 (for Honours)	Geology option (for Majors) or Geology 510 (for Honours)
Option (Science recommended)	Option (Science recommended)
Option	Option

**Geology 337 is a field school that runs for about 15-18 days prior to the Fall Term or after the Winter Term. Students taking a geology field school course in a term are permitted to register in an additional 15 units (2.5 full-course equivalents) in that term (for a total of 18 units (3.0 full-course equivalents)).*

***Geology, Geophysics or Engineering option from the specified list.*

5.4.2 Programs in Geology (Petroleum Geology Concentration)

Admission

See the sections on Enrolment Limitations under the Department of Geoscience and under Section 3 (Faculty Regulations).

Courses constituting the field of Geology (Petroleum Geology Concentration)

- All courses labelled Geology excluding Geology 209, 301, 305, 307, 309, 377, 471

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Degree Programs) and 3.5B (Introductory Courses for Science Degree Programs).

42 units (7.0 full-course equivalents) – Geology 201, 202 or 203, 313 or 423, 323, 333 or 311, 337, 343 or 341, 353 or 373, 381, 445, 463 or 483 or 461 or 583, 491 or 493, 577, 581 or 575 or 591

- Students who have taken Geology 341 (discontinued) do not need to take, and may not receive credit for, either Geology 343 or 445. For these students, Geology 341 replaces Geology 343 and Geology 445 must be replaced with another 3 units (0.5 full-course equivalent) option from the field of Geology.

6 units (1.0 full-course equivalent) - Options from the field of Geology

6 units (1.0 full-course equivalent) - Geophysics 351, Geophysics 559

9 units (1.5 full-course equivalents) - Geology, Geophysics or Engineering options from the following:

- Petroleum Engineering 507, 513, 515, 523, 525, 533, 543, 563, 573
  - A maximum of two of these may be counted towards APEGA Geology requirements. Students are advised to take ENPE 523 first, and to take it in the Fall Term.
- Courses in the field of geology
  - Recommended Options: Geology 401, 435, 463 or 483 or 461 or 583, 537, 541, 545, 561, 579, 597.
- Courses in the field of geophysics
  - Recommended Option: Geophysics 355.

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 253 or 267 or 277

3 units (0.5 full-course equivalent) - Mathematics 211

3 units (0.5 full-course equivalent) - Science 311

6 units (1.0 full-course equivalent) - Science options: same as for Geology Major program (also, see Notes)

12 units (2.0 full-course equivalents) - Options (Science options are recommended - see Notes)

15 units (2.5 full-course equivalents) – Breadth requirement: Non-science options (see Notes)

Notes:

- The Major program may contain a maximum of 66 units (11.0 full-course equivalents) in the field of Geology, and the Honours program may contain a maximum of 78 units (13.0 full-course equivalents) in the field of Geology.
- The Major program must contain at least 9 units (1.5 full-course equivalents) at the 500 level or above from the field of Geology.
- In order to meet the academic requirements for registration with APEGA, 6 units (1.0 full-course equivalent) from the Science Options and/or the Options must be chosen from one or more of biology, chemistry (3 units or 0.5 full-course equivalent maximum), computer science, physics (3 units or 0.5 full-course equivalent maximum), or statistics.
- These 15 units (2.5 full-course equivalents) and Science 311 form the 18 units (3.0 full-course equivalents) non-science course requirements selected from Faculties other than the Faculty of Science (see Table I, 3.4 Program Requirements for courses that may not be used to satisfy this requirement). Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see (d) Breadth requirement in 3.4 Program Requirements.

Required Courses - Honours Program

Same as the Major degree program in Geology (Petroleum Geology Concentration) except that the following course is taken in place of 6 units (1.0 full-course equivalent) of the 9 units (1.5 full-course equivalents) of Geology, Geophysics or Engineering options:

- 6 units (1.0 full-course equivalent) - Geology 510

Suggested Program Sequence (Majors and Honours)

First and Second Years Same as Geology Major program	
Third Year	
Geology 337*	Geology 493
Geology 445	Science option
Geology 463 or 483	Geology option**
GGE option**	Science Option
Non-science option	Non-science option
Fourth Year	
Geology 577	Geology 581
Geology option	Geophysics 559
GGE option** (for Majors) or Geology 510 (for Honours)	GGE option** (for Majors) or Geology 510 (for Honours)
Option (Science recommended)	Option (Science recommended)
Option	Option

**Geology 337 is a field school that runs for about 15-18 days prior to the Fall Term or after the Winter Term. Students taking a geology field school course in a term are permitted to register in an additional 15 units (2.5 full-course equivalents) in that term (for a total of 18 units or 3.0 full-course equivalents).*

***Geology, Geophysics or Engineering Option from the specified list.*

5.4.3 Programs in Applied and Environmental Geology

Admission

Admission to this program has been suspended as of Fall 2015.

See the sections on Enrolment Limitations under the Department of Geoscience and under Section 3 (Faculty Regulations).

Courses constituting the field of Applied and Environmental Geology

- Geology 201, 202 or 203, 313, 323, 333, 337, 343, 353, 381, 401, 403, 503, 435, 441, 445, 505, 510, 571, 597
- Geophysics 351, 355

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Degree Programs) and 3.5B (Introductory Courses for Science Degree Programs).

45 units (7.5 full-course equivalents) - Geology 201, 202 or 203, 313 or 423, 323, 333 or

311, 337, 343 or 341, 353 or 373, 381, 401, 403 or 503, 445, 505, 571, 597

- Students who have taken Geology 341 (discontinued) do not need to take, and may not receive credit for, either Geology 343 or 445. For these students, Geology 341 replaces Geology 343 and Geology 445 must be replaced with another 3 units (0.5 full-course equivalent) option from the field of Geology.

3 units (0.5 full-course equivalent) - Option from the field of Geology (Geology 441 is recommended)

6 units (1.0 full-course equivalent) - Geophysics 351 or 355, 565

6 units (1.0 full-course equivalent) - Physics 211 or 221, 223

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent)- Mathematics 253 or 267 or 277

3 units (0.5 full-course equivalent) - Mathematics 211

3 units (0.5 full-course equivalent) - Mathematics 331

3 units (0.5 full-course equivalents) - Statistics 327

3 units (0.5 full-course equivalents) - Science 311

12 units (2.0 full-course equivalents) - Science or Engineering options chosen from the following (see Notes):

- Applied Mathematics 307 or 311*, 413*, 415*
- Chemistry 311, 315, 321*, 331, 333, 351, 353, 371, or 373
- Civil Engineering 423*, 523*, 525*
- Computer Science 217 or 231 or 235, Computer Science 219 or 233
- Engineering 481*
- Geology courses (from the field of Geology)*
- Geophysics 355*, 453*, 457*, 559*, or other courses from the field of Geophysics
- Mathematics 311*, 349*, 375 or Mathematics 321 or Statistics 321
- Petroleum Engineering 507*, 513*, 515, 523*, 543*
- Physics 321, 323, 325

**Recommended options*

9 units (1.5 full-course equivalents) - Option (Science or Engineering options are recommended)

15 units (2.5 full-course equivalents) - Breadth requirement: Non-science options (see Notes)

Notes:

- The Major program may contain a maximum of 66 units (11.0 full-course equivalents) from the field of Applied and Environmental Geology, and the Honours program may contain a maximum of 78 units (13.0 full-course equivalents) from the field of Applied and Environmental Geology.
- 600-level courses are available to fourth year students with prerequisites and consent of the Department.
- In order to meet the academic requirements for registration with APEGA, the Applied and Environmental Geology Majors program must include, in addition to the physics, chemistry and statistics courses already required in the program, 3 units (0.5 full-course equivalent) in one of biology, chemistry, computer science, statistics or physics. This choice must be made from either the 12 units (2.0 full-course equivalents) Science or Engineering Options or the 9 units (1.5 full-course equivalents) Options for the Applied and Environmental Geology Majors program.
- These 15 units (2.5 full-course equivalents) and Science 311 form the 18 units (3.0 full-course equivalents) non-science course requirements selected from Faculties other than the Faculty of Science (see Table I, 3.4 Program Requirements for courses that may not be used to satisfy this requirement). Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see (d) Breadth requirement in 3.4 Program Requirements.

Required Courses - Honours Program

Same as the Major degree program in Applied and Environmental Geology except that the following course is taken in place of 6 units (1.0 full-course equivalent) of the Science or Engineering options:

- 6 units (1.0 full-course equivalent) - Geology 510

Suggested Program Sequence (Majors and Honours)

First and Second Years Same as Geology Major program	
Third Year	
Geology 337*	Geology option (Geology 441** recommended)
Geology 445	Mathematics 331
Geology 401	Science or Engineering Option
Geology 403	Statistics 327
Non-science option	Non-science option
Fourth Year	
Geology 571	Geology 505
Geology 597	Science or Engineering Option
Geophysics 565	Option (science or engineering recommended)
Science or Engineering option (for Majors), or Geology 510 (for Honours)	Science or Engineering option (for Majors), or Geology 510 (for Honours)
Option	Option

**Geology 337 is a field school that runs for about 15-18 days prior to the Fall Term or after the Winter Term.*

***Geology 441 is a field school that runs for about 12-14 days after the Winter Term.*

Note: Students taking a geology field school course in a term are permitted to register in an additional 15 units (2.5 full-course equivalents) in that term (for a total of 18 units or 3.0 full-course equivalents).

5.4.4 Programs in Geophysics

Admission

See the sections on Enrolment Limitations under the Department of Geoscience and under Section 3 (Faculty Regulations).

Courses constituting the field of Geophysics

- All courses labelled Geophysics excluding Geophysics 365 and 375
- Geology 201, 202 or 203, 341, 343, 381, 449
- Physics 211, 221, 223, 321, 323

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Degree Programs) and 3.5B (Introductory Courses for Science Degree Programs).

30 units (5.0 full-course equivalents) - Geophysics 355, 351 or 359, 453, 457, 517, 547, 549, 551, 557, 559

12 units (2.0 full-course equivalents) - Geology 201, 202 or 203, 343 or 341, 381

- Students who have taken Geology 341 (discontinued) do not need to take, and may not receive credit for, either Geology 343 or 445.

3 units (0.5 full-course equivalent) - Course in the field of Geology

3 units (0.5 full-course equivalent) - Applied Mathematics 415

6 units (1.0 full-course equivalent) - Chemistry 201 or 211, and 203 or 213

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

9 units (1.5 full-course equivalents) - Mathematics 211; 253 or 267 or 277; 331

12 units (2.0 full-course equivalents) - Physics 211 or 221, 223, 321, 323

6 units (1.0 full-course equivalent) - Science or Engineering options from the following:

- Applied Mathematics 307 or 311, 413*
- Chemistry 321, 371, 373
- Computer Science 219 or 233
- Mathematics 311, 349, 375, 411, 421
- Petroleum Engineering 507*, 513*, 515, 523*, 543*
- Physics 325, 341, 343, 397, 455, 497
- Statistics 321, 327*
- Courses in the field of Geophysics*

- Courses in the field of Geology*

Recommended options

18 units (3.0 full-course equivalents) - Breadth requirement: Non-science options (see Section 3 Faculty Regulations, for details and for information on eligible and ineligible courses):

15 units (2.5 full-course equivalents) - Options (science options are recommended)

Notes:

- These 18 units (3.0 full-course equivalents) non-science courses are selected from Faculties other than the Faculty of Science (see Table I, 3.4 Program Requirements for courses that may not be used to satisfy this requirement). Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts (see (d) Breadth requirement in 3.4 Program Requirements).
- The Major program may contain a maximum of 66 units (11.0 full-course equivalents) from the field of Geophysics, and the Honours program may contain a maximum of 78 units (13.0 full-course equivalents) from the field of Geophysics.
- 600-level courses are available to fourth year students with prerequisites and consent of the Department.
- The Majors and Honours programs in Geophysics meet the current academic requirements for professional registration with APEGA.

Required Courses - Honours Program

Same as the Major degree program in Geophysics except that the Honours program must include:

- 3 units (0.5 full-course equivalent) - Applied Mathematics 413
- 3 units (0.5 full-course equivalent) - Geophysics 509
- 3 units (0.5 full-course equivalent) - Statistics 327

Required Courses - Minor Program

6 units (1.0 full-course equivalent) - Geophysics 355, and 351 or 359

6 units (1.0 full-course equivalent) - Geology 201, and 202 or 203

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Geology 341 or 343 or Physics 321 or 323

6 units (1.0 full-course equivalent) - Geophysics 453 and 565

3 units (0.5 full-course equivalent) - One of Geophysics 517, 547, 551, 557, 559

Mathematics and Physics prerequisites for the preceding courses as needed.

Suggested Program Sequence

First Year	
Geology 201	Geology 202
Mathematics 249 or 265 or 275	Mathematics 267 or 277
Chemistry 201 or 211	Chemistry 203 or 213
Physics 211 or 221	Physics 223
Non-science option	Non-science option
Second Year	
Geophysics 351	Geophysics 355
Geology 381	Mathematics 331
Mathematics 211	Science or Engineering option (for Majors), or Statistics 327 (for Honours)
Physics 323	Physics 321
Non-science option	Non-science option
Third Year	
Geophysics 453	Geology 343
Science or Engineering option (for Majors), or Applied Mathematics 413 (for Honours)	Geophysics 457
Computer Science 217 or 231 or 235	Applied Mathematics 415
Option (science recommended)	Option (science recommended)
Non-science option	Non-science option
Fourth Year	
Geophysics 549*	Geophysics 547
Geophysics 517	Geophysics 557
Geophysics 551	Geophysics 559
Option (science recommended) or Geophysics 509 (for Honours)	Geology option
Option	Option

**Geophysics 549 is a field school that runs for about 10-12 days prior to the Fall Term.*

5.4.5 Environmental Science - Geology Concentration

Students may pursue a BSc program in Environmental Science with a concentration in Geology. This is a single-degree, four-year program offered by the Faculty of Science with collaboration from the Faculty of Arts. Program details are listed in 5.6 Non-Departmental Programs. Since this is a multidisciplinary program with restricted entry, students should consult the Director of the Environmental Science program at their earliest opportunity.

Note: Students may also pursue BSc programs in Earth Science which is offered by the Faculty of Arts in collaboration with the Faculty of Science.

5.5 Mathematics and Statistics

Degrees Offered*

Undergraduate Programs	Core	Enhancements	Combined/Concurrent Degrees[1]
Actuarial Science	BSc	BSc Honours, BSc Co-op, BSc Honours Co-op	BComm/BSc[2]
Applied Mathematics	BSc	BSc Honours	
General Mathematics	BSc		BSc/BEd[3]
Pure Mathematics	BSc	BSc Honours	
Statistics	BSc	BSc Honours, BSc Co-op	

**There are many options for graduate studies leading to MSc and PhD degrees in the area of Mathematics and Statistics. Details of graduate specializations can be found in the graduate section of this calendar.*

[1]All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Program to develop a degree completion plan.

[2]Combined Degree with the Haskayne School of Business.

[3]The BSc/BEd program is a current degree offered with the Werklund School of Education. Please see section 5.5.9 and the Education section of the calendar for more details.

Programs Offered

BSc and BSc Honours in Applied Mathematics, Pure Mathematics, Statistics, Actuarial Science

BSc in General Mathematics

BSc and BSc Honours in Actuarial Science Co-operative Education

BComm/BSc Combined Degree in Actuarial Science and Business

BSc/BEd Concurrent Degree in General Mathematics in Education

Minors in Applied or Pure Mathematics, Statistics and Actuarial Science.

Department vs. Faculty Regulations

Programs in the Department of Mathematics and Statistics are governed by a combination of general Faculty of Science regulations and the additional program specific regulations listed below.

It is essential for students to be familiar with both sets of regulations. It is helpful to read Section 3 (Faculty Regulations) first.

Students should consult the Degree Navigator periodically to ensure that all requirements are being met. Also, students are strongly urged to consult the Department at all stages of their program.

Department Information

Courses offered by the Department bear the labels Mathematics, Applied Mathematics, Pure Mathematics, Statistics, and Actuarial Science. Note that (1) the course descriptions appear in the back of this Calendar in five non-contiguous alphabetically arranged blocks, and (2) "Mathematics" is a course label but not a Major field.

All students intending to pursue a Major or Honours program in Applied Mathematics, Pure Mathematics, Statistics, or Actuarial Science should consult the Undergraduate Director. The Undergraduate Director can provide advice on such important matters as specialized programs available within the field, recommended course sequences, possible combinations of Major and Minor fields and recommended undergraduate study leading to graduate study.

Mathematics and Statistics

Department Office: Mathematical Sciences 476

Telephone: 403.220.5203

Fax: 403.282.5150

Website: math.ucalgary.ca/

Email: undergrad@math.ucalgary.ca

Diagnostic Testing and First-Year Mathematics Prerequisites

Refer to C.1 Mathematics Diagnostic Test in the Academic Regulations section.

Special Assessment (Challenge Examinations)

Students who are enrolled in Mathematics 211 or 265, but who feel that they have already mastered the course material, may take a challenge examination during the first week of classes. Students who pass the appropriate test are granted special assessment status for that course and direct entry into Mathematics 311 or 267, respectively. Credit will be given for the course taken by special assessment, a grade assigned, and the regular course fee will be assessed. Students interested in pursuing special assessment should consult the Department during the first week of classes.

Core Courses

All programs include the following common core of courses:

- Mathematics 211 or 213
- Mathematics 249 or 265 or 275
- Mathematics 267 or 277
- Mathematics 311 or 313
- Mathematics 321 or Statistics 321
- Mathematics 367 or 381
- Computer Science 217 or 231 or 235

5.5.1 Recommended First and Second Year Sequence

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 replaces Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

First Year for All Programs	
Mathematics 265 or 275	Mathematics 267 or 277
Mathematics 211 or 213*	Computer Science 231 or 217 or 235
Arts option	Arts option
Option	Option
Non-science option	Non-science option
Second Year for All Programs	
Mathematics 367	Option*
Statistics 321	Statistics 323 or Pure Mathematics 315***
Mathematics 311 or 313*	Option or Actuarial Science 327**
Option or Applied Mathematics 311 or Actuarial Science 325**	Option
Non-science option	Non-science option

**Students in the Department of Mathematics and Statistics programs are encouraged to take Mathematics 213 and 313 for linear algebra. Eligible students should consider the Honours Program in Actuarial Sciences, Applied Mathematics, Pure Mathematics or Statistics.*

***Students in the Actuarial Science programs should choose Actuarial Science 325 and 327; students in the Applied Mathematics programs and Pure Mathematics major programs should choose Applied Mathematics 311.*

****Students in Statistics, Actuarial Science, or Applied Mathematics concentration programs should choose Statistics 323; students in Pure Mathematics, Pure Mathematics concentration, or Applied Mathematics major programs should choose Pure Mathematics 315.*

5.5.2 Programs in Applied Mathematics

Courses constituting the field of Applied Mathematics

- All courses labelled Applied Mathematics except Applied Mathematics 433
- All courses labelled Mathematics except Mathematics 205, 271, 331, and 501
- Pure Mathematics 315, 317, 431
- Statistics 321, 323

Required Courses - Major Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

9 units (1.5 full-course equivalents) - Mathematics 267 or 277 and Mathematics 311 or 313 and Mathematics 321 or Statistics 321

6 units (1.0 full-course equivalent) - Mathematics 349 and 353; or Mathematics 367 or 381 and any course offered in the field of Applied Mathematics at the 300 level or higher

3 units (0.5 full-course equivalent) - Applied Mathematics 311

3 units (0.5 full-course equivalent) - Computer Science 231 or 217 or 235

3 units (0.5 full-course equivalent) - Pure Mathematics 315 or 317 or Statistics 323

6 units (1.0 full-course equivalent) - Two from the list:

Physics 211 or 221 or 227, 223 or 255

Astrophysics 213

Chemistry 201 or 211 and 203 or 213

Computer Science 233, 313, 331

Biology 241, 243

Geophysics 355, 565

6 units (1.0 full-course equivalent) - Applied Mathematics 413 and Mathematics 411

3 units (0.5 full-course equivalent) - One of Mathematics 335 or 355 or Pure Mathematics 435 or 455

3 units (0.5 full-course equivalent) - One of Mathematics 445 or 447 or 545 or Pure Mathematics 445 or 545

3 units (0.5 full-course equivalent) - Mathematics 421 or 521 or Pure Mathematics 421 or 521

3 units (0.5 full-course equivalent) - Applied Mathematics 491

3 units (0.5 full-course equivalent) - Applied Mathematics 411 or 425 or 493

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

45 units (7.5 full-course equivalents) - Options

Note: Mathematics 311 and 411 may be replaced by Mathematics 313 and a field course at the 300 level or higher, with permission.

Required Courses - Honours Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

In addition to the requirements specified by the Faculty of Science (see Section 3), students are required to complete the following program of study:

3 units (0.5 full-course equivalent) - Mathematics 273

9 units (1.5 full-course equivalents) - Mathematics 249 or 265, 267, 367

3 units (0.5 full-course equivalent) - Mathematics 321 or Statistics 321

6 units (1.0 full-course equivalent) - Mathematics 211 or 213 and 311 or 313

3 units (0.5 full-course equivalent) - Pure Mathematics 315 or 317 or Statistics 323

3 units (0.5 full-course equivalent) - Pure Mathematics 431 or Applied Mathematics 481 or 483

3 units (0.5 full-course equivalent) - Mathematics 355 or Pure Mathematics 455

3 units (0.5 full-course equivalent) – Mathematics 447

3 units (0.5 full-course equivalent) - Mathematics 545 or Pure Mathematics 545*

3 units (0.5 full-course equivalent) - Mathematics 423 or 521 or Pure Mathematics 421 or 521

12 units (2.0 full-course equivalents) - Applied Mathematics 311, 411, 413, and 491

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

6 units (1.0 full-course equivalent) - Any 500-level or above course in Applied Mathematics

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

42 units (7.0 full-course equivalents) - Options

**No substitutions will be allowed for Mathematics 545/Pure Mathematics 545.*

Note: Mathematics 213 and 313 are the preferred sequence for the honours program.

Note: The following substitutions allow students to enter the honours program later in their studies:

(a) The calculus sequence Mathematics 265, 267, 367 may be replaced by Mathematics 281, 283, 381 or an equivalent sequence with permission from the Department of Mathematics and Statistics;

(b) Mathematics 273 may be replaced by a grade of "B+" or better in Mathematics 271 with permission;

(c) Mathematics 213 may be replaced by a grade of "B+" or better in Mathematics 211 or 221 with permission;

(d) Mathematics 355/Pure Mathematics 455 may be replaced by a grade of "B+" or better in Mathematics 335/Pure Mathematics 435 with permission.

Suggested First and Second Year Honours in Applied Mathematics

First Year Honours Courses	
Mathematics 211 or 213	Mathematics 273
Mathematics 265	Mathematics 267
Option	Computer Science 217 or 231 or 235
Arts option	Arts option
Option	Non-science option
Second Year Honours Courses	
Mathematics 311 or 313	Option
Mathematics 367	Mathematics 423 or 521
Statistics 321	Pure Mathematics 315 or 317 or Statistics 323
Applied Mathematics 311	Option
Non-science option	Non-science option

Recommendations

Students should consult with the Undergraduate Director on a regular basis throughout their program.

Concentrations

Students may focus their program on one of two areas of interest by including a specified set of courses into their Major degree. Successful completion will mean that the area of concentration will appear on the transcript. Students should carefully plan their course selections to ensure that prerequisites for upper-level courses are obtained. Consultation with the Undergraduate Director on a regular basis is highly recommended.

A. Concentration in Mathematical Finance and Risk Management

The first 24 units (4.0 full-course equivalents) required in the Concentration, up to and including Applied Mathematics 311, are the same as in the Major program. The remaining 96 units (16.0 full-course equivalents) required in the Concentration are:

3 units (0.5 full-course equivalent) - Statistics 323

6 units (1.0 full-course equivalent) - Computer Science 231 and 233 or Computer Science 235 and Actuarial Science 325

3 units (0.5 full-course equivalent) - Mathematics 421 or 423 or Pure Mathematics 421 or 521

3 units (0.5 full-course equivalent) – Mathematics 335 or 355 or Pure Mathematics 435 or 455

3 units (0.5 full-course equivalent) – Mathematics 445 or 447 or 545 or Pure Mathematics 445 or 545

6 units (1.0 full-course equivalent) - Statistics 421 and 507

3 units (0.5 full-course equivalent) - Mathematics 411

18 units (3.0 full-course equivalents) - Applied Mathematics 413, 481, 491, 493, 581, and 583

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

33 units (5.5 full-course equivalents) - Options

B. Concentration in Computational Applied Mathematics

The first 24 units (4.0 full-course equivalents) required in the Concentration, up to and including Applied Mathematics 311, are the same as in the Major program. The remaining 96 units (16.0 full-course equivalents) required in the Concentration are:

3 units (0.5 full-course equivalent) - Statistics 323

6 units (1.0 full-course equivalent) - Computer Science 231 and 233 or 235 and 3 units (0.5 full-course equivalent) senior-level Computer Science option or Applied Mathematics option

3 units (0.5 full-course equivalent) - Mathematics 271 or 273

3 units (0.5 full-course equivalent) - Computer Science 331

3 units (0.5 full-course equivalent) - Software Engineering 301

3 units (0.5 full-course equivalent) - Mathematics 421 or 423 or Pure Mathematics 421 or 521

3 units (0.5 full-course equivalent) – Mathematics 335 or 355 or Pure Mathematics 435 or 455

3 units (0.5 full-course equivalent) - Mathematics 445 or 447 or 545 or Pure Mathematics 445 or 545

3 units (0.5 full-course equivalent) - Mathematics 411

15 units (2.5 full-course equivalents) - Applied Mathematics 413, 425, 491, 493, and 503

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

3 units (0.5 full-course equivalent) - choose one of Biology 241, Chemistry 201 or 203 or 211, Physics 211, 221 or 227

39 units (5.0 full-course equivalents) - Options

Required Courses - Minor Program

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

3 units (0.5 full-course equivalent) - Mathematics 311 or 313

6 units (1.0 full-course equivalent) - Mathematics 349 and 353 or Applied Mathematics 309, or Mathematics 271 or 273 and 381, or Mathematics 271 or 273 and 367

3 units (0.5 full-course equivalent) - Applied Mathematics 307 or 311 or Mathematics 375

9 units (1.5 full-course equivalents) - From the list: Mathematics 321 or Statistics 321, Statistics 323 or any course labelled Applied Mathematics at the 400 level or above, except Applied Mathematics 433.

5.5.3 Programs in Pure Mathematics

Courses constituting the field of Pure Mathematics

- All courses labelled Mathematics except Mathematics 113, 114, 117, 177, 205, 331, 375, 377, 403
- Applied Mathematics 311
- All courses labelled Pure Mathematics
- Statistics 321, 323

Required Courses - Major Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

9 units (1.5 full-course equivalents) - Mathematics 267 or 277 and Mathematics 311 or 313 and Mathematics 321 or Statistics 321

6 units (1.0 full-course equivalent) - Mathematics 349 and 353; or Mathematics 367 or 381 and any course offered in the field of Pure Mathematics at the 300 level or higher

3 units (0.5 full-course equivalent) - Mathematics 271 or 273

3 units (0.5 full-course equivalent) - Pure Mathematics 315 or 317

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

3 units (0.5 full-course equivalent) - Applied Mathematics 311

3 units (0.5 full-course equivalent) - Statistics 323 or Computer Science 233 or Physics 211 or 221

3 units (0.5 full-course equivalent) - Mathematics 411

3 units (0.5 full-course equivalent) - Pure Mathematics 431

3 units (0.5 full-course equivalent) – Mathematics 335 or 355 or Pure Mathematics 435 or 455

3 units (0.5 full-course equivalent) – Mathematics 445 or 447 or 545 or Pure Mathematics 445 or 545

3 units (0.5 full-course equivalent) - Mathematics 421 or 423 or Pure Mathematics 421 or 521

3 units (0.5 full-course equivalent) - Pure Mathematics 415, 418, 423, 425, 427, or 471

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

48 units (8.0 full-course equivalents) - Options

Note: Mathematics 311 and 411 may be replaced by Mathematics 313 and a field course at the 300 level or higher, with permission.

Required Courses - Honours Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

In addition to the requirements specified by the Faculty of Science (see Section 3), students are required to complete the following program of study:

3 units (0.5 full-course equivalent) - Mathematics 273

9 units (1.5 full-course equivalents) - Mathematics 213 and 313 and Mathematics 321 or Statistics 321

9 units (1.5 full-course equivalents) - Mathematics 249 or 265, 267, 367

3 units (0.5 full-course equivalent) - Computer Science 231 or 217 or 235

3 units (0.5 full-course equivalent) - Pure Mathematics 315 or 317

3 units (0.5 full-course equivalent) - Pure Mathematics 431

3 units (0.5 full-course equivalent) - Mathematics 355 or Pure Mathematics 455

3 units (0.5 full-course equivalent) - Mathematics 545 or Pure Mathematics 545*

3 units (0.5 full-course equivalent) - Mathematics 423 or Pure Mathematics 421 or 521

3 units (0.5 full-course equivalent) – Mathematics 447

9 units (1.5 full-course equivalents) - Three of: Pure Mathematics 415, 418, 425, 429, 471, 501, 505, 511, Applied Mathematics 411, 505, 507, 509 with at least 3 units (0.5 full-course equivalent) from the 500 level or above

6 units (1.0 full-course equivalent) - Two from the list:

Applied Mathematics 311 or Statistics 323, Computer Science 233, 313, 331, Physics 211 or 221 or 227, 223, Philosophy 279 or 377

15 units (2.5 full-course equivalents) - Selected from the major field

6 units (1.0 full-course equivalent) - Selected from any course labelled Applied Mathematics, Mathematics, Pure Mathematics or Statistics at the 300 level or above

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

24 units (4.0 full-course equivalents) - Options

**No substitutions will be allowed for Mathematics 545/Pure Mathematics 545.*

Note: The following substitutions allow students to enter the honours program later in their studies:

(a) The calculus sequence Mathematics 265, 267, 367 may be replaced by Mathematics 281, 283, 381 or an equivalent sequence with permission from the Department of Mathematics and Statistics;

(b) Mathematics 273 may be replaced by a grade of "B+" or better in Mathematics 271 with permission;

(c) Mathematics 213 may be replaced by a grade of "B+" or better in Mathematics 211 with permission;

(d) Mathematics 355/Pure Mathematics 455 may be replaced by a grade of "B+" or better in Mathematics 335/Pure Mathematics 435 with permission.

Suggested Program Sequence Honours in Pure Mathematics

First Year Honours Courses	
Mathematics 213	Mathematics 273
Mathematics 265	Mathematics 267
Option	Computer Science 231 or 217 or 235
Arts option	Arts option
Option	Non-science option
Second Year Honours Courses	
Mathematics 313	Mathematics 423
Mathematics 367	Pure Mathematics 317
Mathematics 321 or Statistics 321	Mathematics 447
Mathematics 355	Option
Non-science option	Non-science option

Recommendations

It is highly recommended that students take Philosophy 279 **or** 377 to complement Mathematics 271. Students should consult with the Undergraduate Director on a regular basis throughout their program.

It is recommended that students include an international component in their program. Consult the Undergraduate Director for details.

Required Courses - Minor Program

30 units (5.0 full-course equivalents) - Selected from the field of Pure Mathematics.

The selection might include:

- Mathematics 211 or 213
- Mathematics 249 or 265 or 275
- Mathematics 267 or 277 or 311 or 313
- Mathematics 349 and 353, or Mathematics 367, or 381

5.5.4 Programs in Statistics

Courses constituting the field of Statistics

- Mathematics 211, 213, 249, 253, 265, 267, 273, 275, 277, 311, 313, 349, 353, 381, and 401
- Statistics 205, 321, 323
- All Statistics courses numbered 400 or higher
- Actuarial Science 437, 511

Required Courses - Major Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

9 units (1.5 full-course equivalents) - Mathematics 311 or 313, Mathematics 321 or Statistics 321, Statistics 323

6 units (1.0 full-course equivalent) - Mathematics 349 and 353; or Mathematics 367 or 381 and one from the field of Statistics at the 300 level or higher

3 units (0.5 full-course equivalent) - Computer Science 231 or 217 or 235

9 units (1.5 full-course equivalents) - Statistics 421, 429 and 517

18 units (3.0 full-course equivalents) - Selected from any courses labelled Statistics at the 400 level or above

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

48 units (8.0 full-course equivalents) - Options

Required Courses - Honours Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

Students are expected to enrol in honours courses upon their decision to become honours majors. In addition to the requirements specified by the Faculty of Science (see Section 3), students are required to complete the following program of study:

3 units (0.5 full-course equivalent) - Mathematics 273

9 units (1.5 full-course equivalents) - Mathematics 249 or 265, 267, 367

12 units (2.0 full-course equivalents) - Mathematics 211 or 213, Mathematics 311 or 313, Mathematics 321 or Statistics 321, Statistics 323

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

9 units (1.5 full-course equivalents) - Statistics 421, 429 and 517

24 units (4.0 full-course equivalents) - Selected from any courses labelled Statistics at the 400 level or above

3 units (0.5 full-course equivalent) - Mathematics 335 or 355 or Pure Mathematics 435 or 455

3 units (0.5 full-course equivalent) - Mathematics 445 or 447 or 545 or 421 or 423 or Pure Mathematics 445 or 545 or 421 or 521

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

36 units (6.0 full-course equivalents) - Options

Note: The following substitutions allow students to enter the honours program later in their studies:

(a) The calculus sequence Mathematics 265, 267, 367 may be replaced by Mathematics 281, 283, 381 or an equivalent sequence with permission from the Department of Mathematics and Statistics.

(b) Mathematics 273 may be replaced by a grade of "B+" or better in Mathematics 271 with permission.

(c) Mathematics 213 may be replaced by a grade of "B+" or better in Mathematics 211 or 221 with permission.

Suggested Program Sequence Honours in Statistics

First Year Honours Courses	
Mathematics 211 or 213	Mathematics 273
Mathematics 265	Mathematics 267
Option	Computer Science 231 or 217 or 235
Arts option	Arts option
Option	Non-science option
Second Year Honours Courses	
Mathematics 311 or 313	Option
Mathematics 367	Option
Statistics 321	Statistics 323
Option	Option
Non-science option	Non-science option

Recommendations

Mathematics 421 is a recommended option. Students should consult with the Undergraduate Director on a regular basis throughout their program.

Required Courses - Minor Program

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

6 units (1.0 full-course equivalent) - Mathematics 211 or 213; and Mathematics 311 or 313

3 units (0.5 full-course equivalent) - Mathematics 321 or Statistics 321

3 units (0.5 full-course equivalent) - Statistics 323

12 units (2.0 full-course equivalents) - Selected from any courses labelled Statistics at the 400 level or above.

5.5.5 Programs in Actuarial Science

Courses constituting the field of Actuarial Science

- Mathematics 211, 213, 249, 253, 265, 267, 273, 275, 277, 311, 313, 349, 353, 367, 381, 401
- All courses labelled Actuarial Science
- Statistics 321, 323, 421, 429, 505, 507, 533

Courses in Risk Management and Insurance are not included in the field, but are relevant and are recommended electives for Actuarial Science students. Interested students should consult the Department or the Chair in Risk Management and Insurance in the Haskayne School of Business.

Actuarial Science courses, along with Statistics 421, 429, 505 and 507, cover significant portions of the course of study for the early Casualty Actuarial Society Examinations and Society of Actuaries Examinations/ Courses. Students are advised to select additional courses in Economics, Finance, Risk Management and Insurance, and Statistics as electives in order to complete the course of study for these professional examinations, and also to prepare for the advanced Casualty Actuarial Society Examinations/ Society of Actuaries Examinations/Courses. Students should speak with a Departmental advisor for guidance.

Required Courses - Major Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

6 units (1.0 full-course equivalent) - Mathematics 311 or 313; Mathematics 321 or Statistics 321

3 units (0.5 full-course equivalent) - Statistics 323

6 units (1.0 full-course equivalent) - Mathematics 349 and 353; Mathematics 367 or 381 and one from the field of Actuarial Science at the 300 level or higher

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

12 units (2.0 full-course equivalents) - Actuarial Science 325, 327, 427 and 527

21 units (3.5 full-course equivalents) - Selected from the list:

- Courses labelled Actuarial Science
- Statistics 429, 505, 507, 533

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

42 units (7.0 full-course equivalents) - Options

Note: Not every 400- and 500-numbered Statistics and Actuarial Sciences course is offered every year. Students in third year should ensure they take a sufficient number of these in order to graduate at the end of their fourth year.

Required Courses - Honours Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

In addition to the requirements specified by the Faculty of Science (see Section 3), students are required to complete the following program of study:

3 units (0.5 full-course equivalent) - Mathematics 273

9 units (1.5 full-course equivalents) - Mathematics 249 or 265, 267, 367

9 units (1.5 full-course equivalents) - Mathematics 211 or 213; Mathematics 311 or 313; Mathematics 321 or Statistics 321

3 units (0.5 full-course equivalent) - Statistics 323

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

12 units (2.0 full-course equivalents) - Actuarial Science 325, 327, 427 and 527

3 units (0.5 full-course equivalent) - Statistics 429

21 units (3.5 full-course equivalents) - Selected from the list:

- All Actuarial Science courses;
- Statistics 505, 507, 533

6 units (1.0 full-course equivalent) - Selected from the list:

- All Actuarial Science courses;
- Courses in Economics at the 400 level or above;
- Courses in Risk Management and Insurance at the 300 level or above;
- Courses in Statistics at the 400 level or above.

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

33 units (5.5 full-course equivalents) - Options

Note: The following substitutions allow students to enter the honours program later in their studies:

(a) The calculus sequence Mathematics 249, 265, 267, 277 may be replaced by Mathematics 281, 283, 381 or an equivalent sequence with permission of the Department.

(b) Mathematics 273 may be replaced by a grade of "B+" or better in Mathematics 271 with permission.

(c) Mathematics 213 may be replaced by a grade of "B+" or better in Mathematics 211 with permission.

Suggested Program Sequence Honours in Actuarial Science

First Year Honours Courses	
Mathematics 211 or 213	Mathematics 273
Mathematics 265	Mathematics 267
Option	Computer Science 217 or 231 or 235
Arts option	Arts option
Option	Non-science option
Second Year Honours Courses	
Mathematics 311 or 313	Option
Mathematics 367	Actuarial Science 327
Mathematics 321 or Statistics 321	Statistics 323
Actuarial Science 325	Option
Non-science option	Non-science option

Recommendations

- Not every 400- and 500-numbered Statistics and Actuarial Sciences course is offered every year. Students should consult with the department office to plan for the upcoming cycle of offered courses as well as for a progress assessment on a regular basis throughout their program.
- Actuarial Science 425 is recommended for students in the Actuarial Science program.
- The following courses are some of the recommended options for Actuarial Science students in second (or subsequent) years:
  - Communications Studies 363
  - At least one of Economics 201 and 301. At least one of Economics 203 and 303
  - Risk Management and Insurance 317 (strongly recommended).
  - Options in first year should be selected with these second year options in mind, in order to satisfy prerequisites. At least one course in Economics is strongly recommended.
- The following courses are some of the recommended options for Actuarial Science students in third and fourth years:
  - Courses in Risk Management and Insurance at the 400 level or above, especially 439 and/or 449.
- While a university program will prepare you to join the ranks of the actuarial profession, it is also important for a student to begin writing the professional examinations of the Society of Actuaries and/or Casualty Actuarial Society as soon as possible - but normally not before the end of second year studies - if he or she wishes to find employment in the actuarial industry after graduation. The professional examinations are normally offered on campus twice a year. For more information, please contact a Departmental advisor.

Required Courses - Minor Program

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

3 units (0.5 full-course equivalent) - Mathematics 321 or Statistics 321

3 units (0.5 full-course equivalent) - Statistics 323

6 units (1.0 full-course equivalent) - Mathematics 349 and 353; Mathematics 367 or 381 and one from the field of Actuarial Science at the 300 level or higher

6 units (1.0 full-course equivalent) - Actuarial Science 325 and 327

6 units (1.0 full-course equivalent) - Selected from the following:

- All Actuarial Science courses; Statistics 421, 507, 533

5.5.6 Actuarial Science Co-operative Education Program

Admission

Application deadlines: December 1 and May 1. Students are normally required to apply to the Undergraduate Science Centre.

The Actuarial Science Co-operative Education programs are five-year degree programs which include 12 months of supervised work experience in various companies and government agencies. Students who wish to enter the Actuarial Science Co-operative Education program are urged to discuss their pre-admission course selection with the Department of Mathematics and Statistics as early in their program as possible.

Students should normally have successfully completed at least 48 units (8.0 full-course equivalents) appropriate to their degree program, including Mathematics 321 or Statistics 321, Statistics 323 and Actuarial Science 325 and 327, before commencing the first co-operative education placement. Students must have a minimum grade point average of 2.70 in the field before commencing the Co-operative Education major program, or a minimum grade point average of 3.30 in the field before commencing the Co-operative Education honours program.

Requirements

120 units (20.0 full-course equivalents) - Same as Actuarial Science Majors or Honours

12 months - Co-operative Education work terms (Co-operative Education 501.01, 501.02, 501.03)

A minimum grade point average of 2.70 must be maintained for continuation in the BSc degree programs. A minimum grade point average of 3.30 must be maintained for continuation in the BSc Honours degree program.

Work Term Assessment

The mandatory work term courses, Co-operative Education 501.01, 501.02, 501.03 and the additional course, Co-operative Education 501.04, are graded on a credit (CR) or fail (F) basis. A positive assessment requires satisfactory performance on each of the following items:

(a) The Co-operative Education Co-ordinator's evaluation of job performance, which is based on an on-site visit where practical.

(b) The employer's evaluation of job performance.

(c) The student's self-assessment of job performance and the overall job experience, which is normally based on participation in a debriefing or integrative session.

(d) A work term report prepared by the student and evaluated by the Faculty.

Notes:

- The Faculty may approve registration in Co-operative Education 501.04 in conjunction with an extra (fourth) work term.
- Students should consult the Actuarial Science Co-op Co-ordinator and Co-operative Education and Internship Co-ordinator for program planning.

5.5.7 General Mathematics Program

Courses constituting the field of General Mathematics

- All courses offered by the Department of Mathematics and Statistics (except Applied Mathematics 433)
- Computer Science 491

Required Courses - Major Program

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

9 units (1.5 full-course equivalents) - Mathematics 267 or 277; Mathematics 311 or 313; Mathematics 321 or Statistics 321

6 units (1.0 full-course equivalent) - Mathematics 349 and 353; or Mathematics 367 or 381 and one from the field at the 300 level or higher

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

3 units (0.5 full-course equivalent) - Selected from the field of General Mathematics

15 units (2.5 full-course equivalents) - Selected from the field of General Mathematics at the 300 level or above

9 units (1.5 full-course equivalents) - Selected from the field of General Mathematics at the 400 level or above

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts. Science 311 may be counted among the 18 units (3.0 full-course equivalents) from other Faculties.

51 units (8.5 full-course equivalents) - Options from anywhere

Recommendations

1. Mathematics 205.

2. A Minor to complement this Major is strongly recommended, e.g., in Economics, Physics, Computer Science, or Music.

3. It is recommended that students include an international component in their program.

Students should consult with the Undergraduate Director on a regular basis throughout their program.

5.5.8 Double Major and Major/Minor Combinations

A Double Major program combining any two of Pure Mathematics, Applied Mathematics, Statistics or Actuarial Science can be obtained by a program of study meeting the requirements of both Major programs. A Major in General Mathematics cannot be combined with any other Major or Minor program offered by the Department of Mathematics and Statistics. Note in particular the Faculty of Science requirement that at least 48 units (8.0 full-course equivalents) in each of the two fields be included. For Major/Minor combinations within Pure Mathematics, Applied Mathematics, Statistics and Actuarial Science, the student must obtain the permission of the Undergraduate Director.

Combined degree programs are not available within the Department of Mathematics and Statistics.

5.5.9 Concurrent Degree in General Mathematics in Education and BEd

Admission

Students accepted into the BSc (General Mathematics)/BEd concurrent degree program must meet the requirements for admission into the General Mathematics Program. Students interested in Science education should consider the BSc (Natural Sciences)/BEd concurrent degree program. Students registered in undergraduate degree programs in other faculties of the University of Calgary who wish to transfer to the BEd concurrent program can do so if they have completed no more than six full-course equivalents. Students in the concurrent degree program should also consult the information on the program in the Werklund School of Education portion of the calendar.

Note: Admission to the program is competitive and meeting the minimum requirements does not guarantee admission. Students interested in the concurrent degree program should consult the Department of Mathematics and Statistics and the Werklund School of Education at the earliest possible opportunity.

Requirements

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 will replace Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

The 90 units (15 full-course equivalents) Faculty of Science part of the requirements for a major in the concurrent degree program in General Mathematics and Education are:

3 units (0.5 full-course equivalent) - Education 201

3 units (0.5 full-course equivalent) - English

6 units (1.0 full-course equivalent) - Mathematics 249 or 265; and 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

3 units (0.5 full-course equivalent) - Mathematics 205, 271, 273, Statistics 205

3 units (0.5 full-course equivalent) - Computer Science 217 or 231 or 235

6 units (1.0 full-course equivalent) - Mathematics 311 or 313; Mathematics 349 or 367 or 381

9 units (1.5 full-course equivalents) - From the following: Applied Mathematics 311, Pure Mathematics 315 or 317, 418, Mathematics 321 or Statistics 321, Statistics 323

3 units (0.5 full-course equivalent) - Pure Mathematics 319

9 units (1.5 full-course equivalents) - At the 300 level or higher offered by the Department

6 units (1.0 full-course equivalent) - At the 400 level or higher offered by the Department

36 units (6.0 full-course equivalents) - Options. See the Werklund School of Education section of the Calendar for how these options are to be distributed.

Notes:

- Students who withdraw from the Education component of the concurrent degree program will be required to complete additional courses to obtain the BSc in General Mathematics.
- The General Mathematics in Education degree is only awarded to students who complete all five years of the degree program. Students seeking the concurrent degree should follow the recommended course sequence exactly.

Recommended Course Sequence

Although this course sequence appears flexible with respect to course choices, students should carefully plan their course selections to ensure that prerequisites for upper-level courses are obtained. For example, students interested in taking senior statistics courses should take Statistics 321 and 323 in Year 2, item 2; students interested in senior Pure Mathematics courses should take Pure Mathematics 315 in Year 2, item 2; students interested in senior Applied Mathematics courses should take Applied Mathematics 311 in Year 2, item 2, etc.

First Year

1. Education 201 and 3 units (0.5 full-course equivalent) - English

2. Mathematics 249 or 265 and 211 or 213

3. Mathematics 267 or 277 and 3 units (0.5 full-course equivalent) from the list: Mathematics 205, 271, 273, Statistics 205

4. Computer Science 217 or 231 or 235

5. Open option: 9 units (1.5 full-course equivalents)

Second Year

1. Mathematics 349 or 367 or 381; and Mathematics 311 or 313

2. 9 units (1.5 full-course equivalent) - From the list: Applied Mathematics 311, Pure Mathematics 315 or 317, 418, Mathematics 321 or Statistics 321, Statistics 323

3. 3 units (0.5 full-course equivalent) - Pure Mathematics 319

4. 12 units (2.0 full-course equivalent) - Open options

Third Year

1. Education 420/427

2. Education 430/435

3. Education 440/445

4. Education 450/456

5. Education 460/465

Fourth Year

1. 9 units (1.5 full-course equivalents) - At the 300 level or higher offered by the Department

2. 6 units (1.0 full-course equivalent) - At the 400 level or higher offered by the Department

3. 12 units (2.0 full-course equivalents) - Open options

4. 3 units (0.5 full-course equivalents) - Senior-level open options

Fifth Year

1. Education 520/525

2. Education 530/535

3. Education 540/545

4. Education 550/556

5. Education 560

It is recommended that some courses in the history or philosophy of science and technology be included in the program.

Possibilities are: Engineering 481, Science, Technology and Society 325, 341, History 371, Philosophy 367. It is the responsibility of the student to include the prerequisites for such courses.

5.5.10 Combined Degree and Double Major Suggestions

Please see Section 3.4 (Program Requirements) of the Faculty of Science section of the Calendar concerning programs that combine studies in multiple disciplines – including Double Major and Double Honours programs, Combined Degree Programs within the Faculty of Science, and Combined Degree Programs with other Faculties. Combinations involving programs offered by the Department of Mathematics and statistics and another Discipline that are commonly pursued include

- A Double Major of General Mathematics with Computer Science
- A Double Major of Actuarial Science with Economics
- A Double Major of Actuarial Science with Statistics
- A Combined Program leading to a BComm degree (offered by the Haskayne School of Business) and to a BSc in Actuarial Science

Requirements for such programs are often extremely tight and in some cases involve special course selections. Please consult the Department of Mathematics and Statistics and other relevant Departments or Faculties for advice about course selections if you are interested in these or other program combinations.

5.5.11 Environmental Science - Statistics Concentration

Students may pursue a BSc program in Environmental Science with a concentration in Statistics. This is a single-degree, four-year program offered by the Faculty of Science with collaboration from the Faculty of Arts. Program details are listed in 5.6 Non-Departmental Programs. Since this is a multidisciplinary program with restricted entry, students should consult the Director of the Environmental Science program at their earliest opportunity.

5.6 Non-Departmental Programs: Environmental Science, Nanoscience, Natural Sciences, Neuroscience

5.6.1 Environmental Science

Programs Offered

BSc in Environmental Science

BSc Honours in Environmental Science

The Environmental Science program is a single, four-year multidisciplinary program offered by the Faculty of Science with collaboration from the Faculty of Arts. This multidisciplinary program is flexible in scope. Students must select one of six areas of concentration: Biological Sciences, Chemistry, Geography, Geology, Physics, or Statistics.

For program advice, see the Program Director and/or the Undergraduate Science Centre (USC).

Program vs Faculty Regulations

The Environmental Science program is governed by a combination of general Faculty of Science and Faculty of Arts regulations, as well as the additional program specific regulations listed below. In cases where the regulations of the two Faculties are different, students in the Environmental Science program will follow the regulations listed in the Faculty of Science section.

It is essential for students to be familiar with all regulations and it is helpful to read Section 3 of the Faculty of Science regulations first.

Program Information

Office: Energy Environment Experiential Learning (EEEL) 426

Telephone: 403.220.8979

Website: ucalgary.ca/ensc

Email: ensc@ucalgary.ca

Admission and Enrolment Limitations

Enrolment is limited in the Environmental Science program. Students may be admitted directly into the Environmental Science program and, once admitted, a place in the program is assured for students advancing through the second and subsequent years with satisfactory performance. Admission will be granted for Fall Term only and will be based upon academic merit.

As space permits, a certain number of students who wish to gain admission to the second or third year of the program by transferring from other institutions or programs will be accepted. Any student requesting admission at this level must meet a competitive grade point average calculated over the most recent course work, to a maximum of 30 units (5.0 full-course equivalents). The competitive grade point average will be established annually and will not be lower than 2.50. Students applying for admission must meet the competitive admission average of their chosen concentration.

Courses Constituting the Fields in Areas of Concentration

For each area of concentration, the field will be Environmental Science 401, 501, 502, 504, 505 plus the total of all courses that constitute the major field offered by the department in which the concentration is taken.

5.6.1.1 Program Requirements

(a) Major Program

The student must present an approved list of courses completed with passing grades. This list, referred to as the program, must satisfy the following conditions:

A. (a) The program must contain the equivalent of at least 120 units (20.0 full-course equivalents), with at least 72 units (12.0 full-course equivalents) numbered 300 or above.

(b) The GPA for the program must be at least 2.00 and the GPA for courses in the major field must also be at least 2.00.

(c) The program may not contain more than 18 units (3.0 full-course equivalent) "D" or "D+" grades, or more than 6 units (1.0 full-course equivalent) in the field with a "D" or "D+" grade.

B. (a) The program may not contain more than 60 units (10.0 full-course equivalent) credits transferred from other institutions.

(b) A maximum of 24 units (4.0 full-course equivalent) transfer credits are allowed in the field.

C. The program must contain:

(a) At least 54 units (9.0 full-course equivalents) from outside the major field, of which at least 18 units (3.0 full-course equivalents) must be from outside the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts. Environmental Science 503 may be counted among the 18 units (3.0 full-course equivalent) from other Faculties. A list of recommended courses is available at ucalgary.ca/ensc/academicadvice.

(b) Environmental Science 401, 501, 502, 503,

(c) Biology 241, 243, 313, Ecology 417, 419,

(d) specific Science and Arts courses, depending on the area of concentration chosen by the student.

The entire 120 units (20.0 full-course equivalents), including the courses in Science and Arts specific to each concentration, are as follows:

Concentration in Biological Sciences

21 units (3.5 full-course equivalents) - Biology 241, 243, 311, 313, 315, 331, and 371

3 units (0.5 full-course equivalent) - Biochemistry 393

3 units (0.5 full-course equivalent) - Option from the Field of Biological Sciences[2]

9 units (1.5 full-course equivalents) - Ecology 417, 419 and 425

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 and 203 or 213

15 units (2.5 full-course equivalents) - Chemistry 311, 315, 351, 353 and one of 321 or 515

6 units (1.0 full-course equivalent) - Mathematics 249 or 265 or 275 and Mathematics 211 or 213 or 267 or 277

6 units (1.0 full-course equivalent) - Physics 211 or 221 and 223 or Geology 201 and 202 or 203

3 units (0.5 full-course equivalent) - Geography 211 or Geology 201

3 units (0.5 full-course equivalent) - Geography 415[1]

15 units (2.5 full-course equivalents) - Environmental Science 401, 501, 502 and 503

9 units (1.5 full-course equivalents) - Options from Faculties other than the Faculty of Science, as noted in 5.6.1.1C (a)[2]

6 units (1.0 full-course equivalent) - Options from the Faculty of Arts[2]

15 units (2.5 full-course equivalents) - Options

[1]Environmental Science students may contact the Department of Geography for consent to register in this course.

[2]See ucalgary.ca/ensc/academicadvice for a list of recommended courses.

Concentration in Chemistry

15 units (2.5 full-course equivalents) - Biology 241, 243, 313, Ecology 417 and 419

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 and 203 or 213

33 units (5.5 full-course equivalents) - Chemistry 311, 315, 321, 331, 333 or 373, 351, 353 or 355, 371, 423 or 425, 515, 521 or 541

3 units (0.5 full-course equivalent) - Option from the field of Chemistry

3 units (0.5 full-course equivalent) - Statistics 327

3 units (0.5 full-course equivalent) - Geology 201

6 units (1.0 full-course equivalent) - Mathematics 249 or 265 or 275; Mathematics 267 or 277

9 units (1.5 full-course equivalents) - Physics 211 or 221 and 223 and 323

15 units (2.5 full-course equivalents) - Environmental Science 401, 501, 502 and 503

9 units (1.5 full-course equivalents) - Options from Faculties other than the Faculty of Science, as noted in 5.6.1.1C (a)[1]

6 units (1.0 full-course equivalent) - Options from the Faculty of Arts[1]

12 units (2.0 full-course equivalents) - Options[1]

[1]See ucalgary.ca/ensc/academicadvice for a list of recommended courses.

Concentration in Geography and Arts

3 units (0.5 full-course equivalent) - Archaeology 201 or Anthropology 203

15 units (2.5 full-course equivalents) - Biology 241, 243, 313, Ecology 417 and 419

6 units (1.0 full-course equivalent) - Chemistry 203 and 321

30 units (5.0 full-course equivalents) - Geography 211, 231, 251 or 253, 305 or 307, 313, 321, 333 or 357, 340, 413 or 417, and 415

3 units (0.5 full-course equivalent) – Geography 341 or 351 or 367 or 405 or 433 or 457

3 units (0.5 full-course equivalent) – Geography 421 or 429 or 529

3 units (0.5 full-course equivalent) – Statistics 327

12 units (2.0 full-course equivalents) - Economics 201, 203, 323 or 325 or 327 or 337 or 367 and 377

6 units (1.0 full-course equivalent) - Mathematics 249 or 265 or 275; Mathematics 211 or 213 or 267 or 277

3 units (0.5 full-course equivalent) - Psychology 200 or 205 or Sociology 201

15 units (2.5 full-course equivalents) - Environmental Science 401, 501, 502 and 503

6 units (1.0 full-course equivalent) - Options from the Faculty of Arts[1]

15 units (2.5 full-course equivalents) - Options[1]

Recommended courses: Physics 211 or 221 and 223

[1]See ucalgary.ca/ensc/academicadvice for a list of recommended courses.

Concentration in Geology

15 units (2.5 full-course equivalents) - Biology 241, 243, 313, Ecology 417 and 419

9 units (1.5 full-course equivalents) - Chemistry 201 or 211, 203 or 213 and 321

39 units (6.5 full-course equivalents) - Geology 201, 202 or 203, 313 or 423, 323, 333 or 311, 337, 341 or 343, 353 or 373, 381, 401, 475, 403 or 503, and 505

9 units (1.5 full-course equivalents) - Mathematics 211 or 213, 249 or 265 or 275 and 253 or 267 or 277

6 units (1.0 full-course equivalent) - Physics 211 or 221, and 223

3 units (0.5 full-course equivalent) - Statistics 327

15 units (2.5 full-course equivalents) - Environmental Science 401, 501, 502 and 503

9 units (1.5 full-course equivalents) - Options from Faculties other than the Faculty of Science, as noted in 5.6.1.1C (a)[1]

6 units (1.0 full-course equivalent) - Options from Faculty of Arts[1]

9 units (1.5 full-course equivalents) - Options

[1]See ucalgary.ca/ensc/academicadvice for a list of recommended courses.

Concentration in Physics

15 units (2.5 full-course equivalents) - Biology 241, 243, 313, Ecology 417 and 419

6 units (1.0 full-course equivalent) - Chemistry 203 and 321

3 units (0.5 full-course equivalent) - Geology 201

18 units (3.0 full-course equivalents) - Mathematics 211 or 213, Mathematics 275* or 281, Mathematics 277* or 283, Mathematics 375*, Mathematics 377*, Mathematics 311

36 units (6.0 full-course equivalents) - One of four sequences of Physics courses:

Option I: Physics 227, 255, 325, 341, 343, 397, 443, 449, 455, 561, 663 and one of Physics 375, 457, 497, 501**, 507, 509, 543, or 593 or 599

Option II: Physics 223, 227, 323, 325, 341, 343, 397, 443, 449, 455, 561 and one of Physics 375, 457, 497, 501**, 507, 509, 543, 593, 599 or 663

Option III: Physics 211 or 221, 255, 321, 325, 341, 343, 397, 443, 449, 455, 561, and one of 375, 457, 497, 501**, 507, 509, 543, 593, 599 or 663

Option IV: Physics 211 or 221, 223, 321, 323, 325, 341, 343, 443, 449, 455, 561, and one of 375, 457, 497, 501**, 507, 509, 543, 593, 599 or 663

3 units (0.5 full-course equivalent) - Statistics 327

15 units (2.5 full-course equivalents) - Environmental Science 401, 501, 502 and 503

9 units (1.5 full-course equivalents) - Options from Faculties other than the Faculty of Science, as noted in 5.6.1.1C (a).

6 units (1.0 full-course equivalent) - Options from Faculty of Arts[1]

9 units (1.5 full-course equivalents) - Options

**The sequence Mathematics 249 or 265, 267, 367 plus Mathematics 311 can be used in place of Mathematics 275, 277, 375, 377 but is not recommended. Mathematics 267 plus 177 can be used in place of Mathematics 277.*

***Physics 501 requires Physics 457 as a prerequisite.*

[1]See ucalgary.ca/ensc/academicadvice for a list of recommended courses.

Concentration in Statistics

15 units (2.5 full-course equivalents) - Biology 241, 243, 313, Ecology 417 and 419

6 units (1.0 full-course equivalent) - Chemistry 203 and 321

3 units (0.5 full-course equivalent) - Geology 201

6 units (1.0 full-course equivalent) - Physics 211 or 221 and 223

12 units (2.0 full-course equivalents) - Mathematics 211 or 213, 249 or 265 or 275, 267 or 277, 367

18 units (3.0 full-course equivalents) - Statistics 321, 323, 327, 421, 429 and 517

12 units (2.0 full-course equivalents) - Four of Statistics 423, 425, 505, 407 or 507, 519, 523, 525, 531

3 units (0.5 full-course equivalent) - Computer Science 217

15 units (2.5 full-course equivalents) - Environmental Science 401, 501, 502 and 503

9 units (1.5 full-course equivalents) - Options from Faculties other than the Faculty of Science, as noted in 5.6.1.1C (a).

6 units (1.0 full-course equivalent) - Options from the Faculty of Arts[1]

15 units (2.5 full-course equivalents) - Options

[1]See ucalgary.ca/ensc/academicadvice for a list of recommended courses.

(b) Honours Programs

The GPA requirements for the Honours program are specified in the Faculty of Science section of this Calendar in 3.4C Program Requirements, Honours Program. The course requirements are the same as for the Major programs except students must have a minimum of 54 units (9.0 full-course equivalents) in their field and include one of Environmental Science 504 or 505 in their program, preferably in their final year of study. Students in an honours program may have a maximum of 78 units (13.0 full courses) in their major field.

Suggested Program Sequences

Biological Sciences

First Year	
Biology 241	**Biology 243**
Chemistry 201 or 211	Chemistry 203 or 213
Mathematics 249 or 265 or 275	Mathematics 211 or 213 or 267 or 277
Physics 211 or 221 or Geology 201[1]	Physics 223 or Geology 202

Option	Option
Second Year	
Biology 371	Biology 315
Geography 211 or Geology 201[1]	Biology 313
Chemistry 351	Chemistry 353
Chemistry 311	Chemistry 315
Option	Option
Third Year	
Biology 311	Biology 331
Ecology 425	Ecology 419
Environmental Science 401[1]	Geography 415
Option from the Field of Biological Sciences	Biochemistry 393
Option	Option
Fourth Year	
Environmental Science 501[1]	Environmental Science 503
Environmental Science 502	Environmental Science 502
Chemistry 321 or 515	Option
Ecology 417	Option
Option	Option

[1]Field course typically offered in the last two weeks before the beginning of the regular Fall Term.

Chemistry

First Year	
Chemistry 201 or 211	Chemistry 203 or 213
Mathematics 249 or 265 or 275	Mathematics 267 or 277
Physics 211 or 221	Physics 223
Biology 241	Biology 243
Option	Option
Second Year	
Chemistry 351	Chemistry 353 or 355
Chemistry 311	Chemistry 315
Geology 201	Biology 313
Physics 323	Statistics 327
Option	Option
Third Year	
Chemistry 331	Ecology 419
Environmental Science 401[1]	Chemistry 371
Chemistry 321	Chemistry 333 or Option
Chemistry 373 or Option	Chemistry 425 or Option
Option	Option
Fourth Year	
Environmental Science 501[1]	Environmental Science 503
Environmental Science 502	Environmental Science 502
Chemistry 515	Chemistry 521 or 541
Ecology 417	Option
Chemistry 423 or Option	Option

[1]Field course typically offered in the last two weeks before the beginning of the regular Fall Term.

Geography and Arts

First Year	
Geography 211	Geography 231
Economics 201	Geography 251 or Geography 253
Mathematics 249 or 265 or 275	Economics 203
Biology 241	Mathematics 211 or 267 or 277
Option	Biology 243
Second Year	
Chemistry 203	Biology 313
Geography 313	Economics 377
Geography 341 or 351 or 367 or 405 or 433 or 457	Archaeology 201 or Anthropology 203
Geography 333 or 357	Psychology 200 or Sociology 201
Option	Statistics 327
Third Year	
Environmental Science 401[1]	Ecology 419
Geography 305 or 307	Economics 323 or 325 or 327 or 337 or 367
Geography 321	Geography 413 or 417
Chemistry 321	Geography 415
Option	Option
Fourth Year	
Environmental Science 501[1]	Environmental Science 503
Environmental Science 502	Environmental Science 502
Ecology 417	Geography 421 or 429 or 529
Geography 340	Option
Option	Option

[1]Field course typically offered in the last two weeks before the beginning of the regular Fall Term.

Geology

First Year	
Geology 201	Geology 202
Biology 241	Biology 243
Mathematics 249 or 265 or 275	Mathematics 267 or 277
Physics 211 or 221	Physics 223
Chemistry 201 or 211[1]	Chemistry 203 or 213[1]
Second Year	
Geology 313	Geology 323
Option	Geology 333
Mathematics 211 or 213	Geology 343
Option	Geology 353
Geology 381	Statistics 327
Third Year	
Chemistry 321	Biology 313
Geology 401	Statistics 327
Environmental Science 401[2,3,4]	Option
Geology 337[3,4]	Option
Geology 475	Option
Fourth Year	
Environmental Science 501[2,4]	Environmental Science 503
Environmental Science 502	Environmental Science 502
Geology 403	Geology 505
Ecology 417	Ecology 419
Option	Option

[1]Chemistry 201 and 203 are offered in both Fall and Winter Terms and may be taken in any order. Chemistry 211 and 213 are recommended for students majoring in Chemistry and other students with strong backgrounds in chemistry. Chemistry 211 is a prerequisite to Chemistry 213.

[2]Field course typically offered in the last two weeks before the beginning of the regular Fall Term.

[3]Environmental Science 401 and Geology 337 are field schools that run prior to the Fall Term. Geology 337 is offered with dates throughout the month of August. Students will need to carefully select a section of Geology 337 that is compatible with their section of Environmental Science 401.

[4]Students taking a field school course(s) in a term are permitted to register in additional units during that term to a maximum of 30 units (5.0 full course equivalents) during the regular term.

Physics

First Year	
Physics 227[1]	Physics 223
Biology 241	Biology 243
Mathematics 275	Mathematics 277
Chemistry 203	Mathematics 211 or 213
Option	Option
Second Year	
Physics 341	Physics 325
Physics 397	Physics 343
Mathematics 375	Mathematics 377
Geology 201	Statistics 327
Biology 313 or Option	Biology 313 or Option
Third Year	
Environmental Science 401[2]	Physics 443
Physics 323	Physics 561
Physics 449	Physics Option
Physics 663	Option
Mathematics 311	Option
Fourth Year	
Environmental Science 501[2]	Environmental Science 503
Environmental Science 502	Environmental Science 502
Physics 455	Ecology 419
Chemistry 321	Option
Ecology 417	Option

[1]Students who achieve a grade of "A-" or better in Physics 211 or 221 may use either of these courses in place of Physics 227.

[2]Field course typically offered in the last two weeks before the beginning of the regular Fall Term.

Statistics

First Year	
Physics 211 or 221	Mathematics 267
Biology 241	Biology 243

Mathematics 211 or 213	Physics 223
Mathematics 265	Statistics 327
Option	Option
Second Year	
Statistics 321	Statistics 323
Mathematics 367	Computer Science 217
Chemistry 203	Biology 313
Option	Option
Option	Option
Third Year	
Environmental Science 401[1]	Statistics option
Statistics 421	Statistics option
Statistics 429	Ecology 419
Geology 201	Option
Option	Option
Fourth Year	
Environmental Science 501[1]	Statistics option
Environmental Science 502	Environmental Science 502
Ecology 417	Statistics option
Chemistry 321	Statistics 517
Option	Environmental Science 503

[1]Field course typically offered in the last two weeks before the beginning of the regular Fall Term.

5.6.1.2 Double Major and Combined Degree Programs

No degree combination will be allowed where both parts of the combination are in the same field of specialization (i.e. Double Major, Major-Minor, Combined Degree, Second Bachelor's Degree). The double major combination BSc Environmental Science specialization in Biological Sciences/BSc Ecology and BSc Environmental Science specialization in Biological Sciences/BSc Biological Sciences will not be allowed, however all other combinations of Major programs in Biological Sciences and BSc Environmental Science specialization in Biological Sciences will be allowed.

Double major programs are allowed combining any two of: (i) Geology or Geology (Petroleum Geology Concentration), (ii) Applied and Environmental Geology, (iii) Geophysics, (iv) Earth Science, (v) Environmental Science (Geology).

Double degree programs are allowed combining Geophysics with one of (i) Geology, (ii) Geology (Petroleum Geology Concentration), (iii) Applied and Environmental Geology, (iv) Environmental Science (Geology).

There is no Minor program available in Environmental Science.

5.6.2 Nanoscience

Programs Offered in Nanoscience

- Minor or Concentration in Nanoscience

Note: If applications exceed the capacity of the Minor and Concentration in Nanoscience, priority will be given to students in satisfactory standing in the BSc or BSc (Honours) in Applied Chemistry, Biochemistry, Biological Sciences, Cellular, Molecular and Microbial Biology, Chemistry, Chemical Physics, Ecology, Geology, Geophysics, Physics, Plant Biology or Zoology.

Program vs. Faculty Regulations

Regulations governing the Minor or Concentration in Nanoscience are a combination of general Faculty of Science regulations and the additional program specific regulations listed below. It is essential for students to be familiar with both sets of regulations. It is helpful to read Section 3 (Faculty Regulations) first.

Students are advised to check the Degree Navigator periodically to ensure that all requirements are being met.

Program Information

Program Student Office: Science B 149

Student enquiries: 403.220.8367

Fax: 403.210.8126

Website: ucalgary.ca/nanoscience

Email: nanosci@ucalgary.ca

Enrolment Limitations

Enrolment Limitations in Program

The number of spaces in the Nanoscience Concentration and Minor is limited and entry is competitive.

Enrolment Limitations in Courses

In the first instance, enrolment in Nanoscience courses is available to Nanoscience Concentrators or Minors in satisfactory standing who meet the prerequisite(s). Depending on space availability, other students who are in satisfactory standing and meet the prerequisite(s) may register in a course. Consult the Schedule of Classes for details regarding enrolment in these courses.

5.6.2.1 Programs in Nanoscience

Admission

Students in satisfactory standing may select the Nanoscience Concentration or Minor after they have completed at least 21 units (3.5 full-course equivalents). Note: If applications exceed the capacity of the Minor or Concentration in Nanoscience, priority will be given to students in satisfactory standing in the BSc or BSc Honours in Applied Chemistry, Biochemistry, Biological Sciences, Cellular, Molecular and Microbial Biology, Chemistry, Chemical Physics, Ecology, Geology, Geophysics, Physics, Plant Biology or Zoology. See also 3.2 Admission.

Any course used to satisfy Major or Honours field requirements may not be applied to the Nanoscience Concentration or Minor.

Courses Constituting the Field of Nanoscience

The field of Nanoscience is defined as:

- Biology 241 and 243
- Chemistry 201, 203, 211 and 213
- Geology 201 and 202 or 203
- All courses labelled 200-level Mathematics except Mathematics 205
- All courses labelled Nanoscience
- Physics 211, 221, 223, 227 and 255

Required Courses - Concentration

See also Section 3 (Faculty Regulations), Subsection 3.4A (Program Requirements - Major and Honours Programs) and Subsection 3.5B (Course Selection and Registration - Introductory Courses for Science Degree Programs).

1. 3 units (0.5 full-course equivalent) – One of Mathematics 249 or 265 or 275

2. 3 units (0.5 full-course equivalent) – One of Mathematics 267 or 277 or 211 or 213

3. 6 units (1.0 full-course equivalent) – One of the following sets of courses:
   - Biology 241 and 243
   - Chemistry 201 or 211 and 203 or 213
   - Geology 201 and 202 or 203
   - Physics 211 or 221 and 223, or Physics 227 and 255

4. 6 units (1.0 full-course equivalent) – Nanoscience 301 and 401

5. 3 units (0.5 full-course equivalent) – Additional Nanoscience courses

Note: Students may complete no more than 6 units (1.0 full-course equivalent) additional courses labelled Nanoscience beyond those listed above.

Required Courses - Minor

Same as for the Concentration up to (4):

12 units (2.0 full-course equivalents) – Nanoscience 301, 401 and 502

6 units (1.0 full-course equivalent) – Additional Nanoscience courses

Note: Students may complete no more than 6 units (1.0 full-course equivalent) additional courses labelled Nanoscience beyond those listed above.

5.6.3 Natural Sciences

Degrees Offered

Undergraduate Programs**	Core	Enhancements	Combined Degrees
Natural Sciences	BSc	BSc Honours	BSc/BEd[1]

***All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Centre to develop a degree completion plan.*

[1]Concurrent Degree with the Werklund School of Education

Programs Offered

BSc in Natural Sciences

BSc Honours in Natural Sciences

BSc (Natural Sciences) and BEd

Program vs. Faculty Regulations

Regulations governing programs in Natural Sciences are a combination of general Faculty of Science regulations and the additional program specific regulations listed below. It is essential for students to be familiar with both sets of regulations. It is helpful to read Section 3 (Faculty Regulations) first.

Students are advised to check the Degree Navigator periodically to ensure that all requirements are being met.

Program Information

Program Office: Energy Environment Experiential Learning (EEEL) 426

Telephone: 403.220.8979

Fax: 403.210.8126

Website: natsci.ucalgary.ca

Email: sciemail@ucalgary.ca

Enrolment Limitations

A graduation requirement for students in the Natural Sciences program is the completion of two concentrations; see "Application to Concentrations". Entry into a given concentration may be subject to enrolment limitations. Students should refer to Subsection 3.3 on Enrolment Limitations under Section 3 (Faculty Regulations), and the sections on enrolment limitations under the regulations of the Department offering the courses in which the student is interested. Students who apply for a concentration in an area with enrolment limitations will be subject to the same selection criteria as students intending to major in that area.

Students Intending to Transfer to Other Science Programs

Students who enter the Natural Sciences program with the intention of transferring to another program offered by the Faculty of Science may follow the requirements and sequence of their intended program for the first two years. However, students who are unsuccessful gaining admission to their intended major by their third year are advised to meet with a Program Advisor in the Undergraduate Science Centre (USC) to discuss the requirements to complete a Natural Sciences degree. Students should be aware they will be blocked from taking more than 36 units (6.0 full course equivalents) in a major field to which they have not been admitted.

5.6.3.1 Programs in Natural Sciences

Admission

See also Section 3 (Faculty Regulations), Subsection 3.2 (Admission).

Application to Concentrations

The program requires students to choose two concentrations*, denoted Concentration One (C1) and Concentration Two (C2) respectively, from the following list: Biology, Chemistry, Computer Science, Energy Science, Geoscience, Mathematics or Physics. Entry into a given concentration may be subject to enrolment limitations. (See Enrolment Limitations.)

Students may apply to their concentrations with their initial application to the University. However, students may also initially apply to Natural Sciences with no concentrations in the event that they are uncertain which areas they wish to specialize in or they do not meet the competitive average of their desired concentration(s). Students will find that it is in their best interest to declare their concentrations at the earliest possible opportunity.

**It is not possible for students in the Natural Sciences program to choose a minor in either area of their concentrations. However, students may complete a minor outside of their areas of concentration. Furthermore, Natural Sciences students may not select a second major or combined degree in areas of their two concentrations.*

Courses Constituting the Major Field of Natural Sciences

The Major field of an individual's Natural Sciences program is defined as:

- The total of all courses that constitute the major fields offered by departments in which the two concentrations are taken.
- Science 301, 403, 421, 423, 501, 502, 507, 521, 529, 531, 533.

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Degree Programs) and 3.5B (Introductory Courses for Science Degree Programs).

1. Major Field Courses (Concentrations One and Two)

The program must contain two concentrations as described under Application to Concentrations.

The courses in the two concentrations must be selected as follows:

Students require a minimum of 30 units (5.0 full-course equivalents) in their C1.

Students may not exceed 36 units (6.0 full-course equivalents) in their C1. Within those courses completed for their C1, students must complete a minimum of 3 units (0.5 full-course equivalent) at the 400 level or higher.

Students require a minimum of 18 units (3.0 full-course equivalents in their C2. Students may not exceed 30 units (5.0 full-course equivalents in their C2.

The combination of units in C1 plus C2 may not exceed 60 units (10.0 full-course equivalents).

2. Natural Science Specific Courses

3 units (0.5 full-course equivalent) - Science 301

3 units (0.5 full-course equivalent) - Science 403

3 units (0.5 full-course equivalent) - Science 501 or Science 529 (for Energy Science concentrators)

3. Other Courses outside the Major Field

18 units (3.0 full-course equivalents) - Non-science options as follows (check Table I in 3.4 Program Requirements for ineligible courses; Science 311 may be counted among these courses):

Chosen from Faculties other than the Faculty of Science. Of these 18 units (3.0 full-course equivalents), students must take at least 6 units (1.0 full-course equivalent) from the Faculty of Arts.

4. Science Breadth

The program must include the following:

- 6 units (1.0 full-course equivalent) in Mathematics*, selected from Mathematics 211 or 213, Mathematics 249 or 265 or 275, Mathematics 267 or 277. Note: Students who have completed Mathematics 31 should take Mathematics 265 unless they are interested in pursuing programs in Physics and Astronomy, in which case they should take Mathematics 275
- 3 units (0.5 full-course equivalent) in Computer Science* selected from Computer Science 217 or 231 or 235
- At least 6 units (1.0 full-course equivalent) from each of four different Science Departments*
- 6 units (1.0 full-course equivalent) of course work accompanied by a laboratory component* (taken from any of the Departments of Biological Sciences, Chemistry, Geoscience, and Physics and Astronomy)

**Apply these courses to either (1) Major Field courses or (3) Other Courses outside the Major Field as appropriate.*

Required Courses - Honours Program

Same as for Major Program except:

6 units (1.0 full-course equivalent) - Minimum number of courses in C1 that must be at the 400 level or higher.

6 units (1.0 full-course equivalent) - Science 502

Required Courses - Concentration One

Biology Concentration. The minimum requirements for a C1 in Biology are as follows:

6 units (1.0 full-course equivalent) - Biology 241 and 243

9 units (1.5 full-course equivalents) - Biology 311, 331 and 371

3 units (0.5 full-course equivalent) - Biochemistry 393 or Biology 313

9 units (1.5 full-course equivalents) - Courses from the field of Biological Sciences at the 300 level or higher

3 units (0.5 full-course equivalent) - Courses from the field of Biological Sciences at the 400 level or higher

Note: Natural Sciences students are not permitted to take more than 6 units (1.0 full-course equivalent) from courses numbered 507 offered by the Department of Biological Sciences.

Chemistry Concentration. The minimum requirements for a C1 in Chemistry are as follows:

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 and 203 or 213

12 units (2.0 full-course equivalents) - Chemistry 311, 331, 351 and 371 or 373

9 units (1.5 full-course equivalents) - Courses from the field of Chemistry at the 300 level or higher

3 units (0.5 full-course equivalent) - Courses from the field of Chemistry at the 400 level or higher

Computer Science Concentration[1]**.** The minimum requirements for a C1 in Computer Science are as follows:

6 units (1.0 full-course equivalent) - One of the following three sets of courses:

- Computer Science 217 and 219
- Computer Science 231 and 233
- Computer Science 235 and 0.5 full-course equivalent) senior Computer Science Option

3 units (0.5 full-course equivalent) - Computer Science 319 or 331

18 units (3.0 full-course equivalents) - Courses in the field of Computer Science

3 units (0.5 full-course equivalent) - Courses in the field of Computer Science at the 400 level or higher

[1]Students interested in completing a C1 in Computer Science should complete Philosophy 279 in their first year.

Energy Science Concentration. The minimum requirements for a C1 in Energy Science are as follows:

3 units (0.5 full-course equivalent) - Chemistry 203 or 213

3 units (0.5 full-course equivalent) - Physics 211 or 221 or 227

3 units (0.5 full-course equivalent) - Physics 223 or 255

3 units (0.5 full-course equivalent) - Engineering Energy and Environment 355

3 units (0.5 full-course equivalent) - Chemistry 321 or 425

15 units (2.5 full-course equivalents) - Chosen from Science 421, 423, 521, 531, 533, Physics 323, 325, or 397 (a maximum 1.0 full-course equivalent) can be chosen from Physics 323, 325, 397)

Note: Energy Science students completing a Concentration Two in Physics will have the first-year Physics courses count toward both concentrations. No Physics courses beyond required first-year Physics courses can count toward both Energy Science and a Physics concentration. A maximum of 6 units (1.0 full-course equivalent) from Physics 323, 325 and 397 can be used towards completion of the Energy Sciences Concentration. Energy Science students completing a Concentration Two in Chemistry will have Chemistry 203 count toward both concentrations.

Geoscience Concentration. The minimum requirements for a C1 in Geoscience are as follows:

15 units (2.5 full-course equivalents) - Geology 201, 202 or 203, 343 or 341, 381, and Geophysics 351 or 355

12 units (2.0 full-course equivalents) - Courses in the fields of Geology and/or Geophysics at the 300 or 400 levels[1]

3 units (0.5 full-course equivalent) - Courses in the fields of Geology and/or Geophysics at the 400 level or higher[1]

[1]Students pursuing a Geoscience concentration are free to mix and match appropriate Geology and Geophysics options. It is recommended that students intending to apply for admission into the Geology program (including the Petroleum Geology concentration) take Geology 313, 381, 323, 333 while students intending to apply for admission into the Geophysics program take Geophysics 351 or 359, 453, 457 and an additional Geology or Geophysics option. For more details, see the Geoscience Program Section of this Calendar.

Mathematics Concentration. The minimum requirements for a C1 in Mathematics are as follows:

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 249 or 265 or 275

3 units (0.5 full-course equivalent) - Mathematics 267 or 277

6 units (1.0 full-course equivalent) - Mathematics 311 or 313, Statistics 321

3 units (0.5 full-course equivalent) – Mathematics 367 or 375

9 units (1.5 full-course equivalent) - Courses in the field of General Mathematics.

3 units (0.5 full-course equivalent) - Courses in the field of General Mathematics at the 400 level or higher

Physics Concentration. The minimum requirements for a C1 in Physics are as follows:

6 units (1.0 full-course equivalent) - Either Physics 211 or 221 and 321 or Physics 227 and 3 units (0.5 full-course equivalent) Physics option

6 units (1.0 full-course equivalent) – Either Physics 223 and 323 or 255 and 397

15 units (2.5 full-course equivalents) - Courses in the field of Physics[1] at the 300 level or higher

3 units (0.5 full-course equivalent) - Courses in the field of Physics[1] at the 400 level or higher

[1]Students completing either a C1 or C2 in Physics may use courses in Astrophysics to satisfy requirements from the field of Physics.

Required Courses - Concentration Two

Biology Concentration. The minimum requirements for a C2 in Biology are as follows:

A minimum of 18 units (3.0 full-course equivalents) to a maximum of 30 units (5.0 full-course equivalents) selected from the major field of Biological Sciences.

Chemistry Concentration. The minimum requirements for a C2 in Chemistry are as follows:

A minimum of 18 units (3.0 full-course equivalents) to a maximum of 30 units (5.0 full-course equivalents) selected from the major field of Chemistry

Computer Science Concentration. The minimum requirements for a C2 in Computer Science are as follows:

A minimum of 18 units (3.0 full-course equivalents) to a maximum of 30 units (5.0 full-course equivalents) selected from the major field of Computer Science.

Energy Science Concentration. A Concentration Two in Energy Science is not permitted.

Geoscience Concentration. The minimum requirements for a C2 in Geoscience are as follows:

A minimum of 18 units (3.0 full-course equivalents) to a maximum of 30 units (5.0 full-course equivalents) selected from the major field of Geology and/or Geophysics.

Mathematics Concentration. The minimum requirements for a C2 in Mathematics are as follows:

A minimum of 18 units (3.0 full-course equivalents) to a maximum of 30 units (5.0 full-course equivalents) selected from the major field of General Mathematics.

Physics Concentration. The minimum requirements for a C2 in Physics are as follows:

A minimum of 18 units (3.0 full-course equivalents) to a maximum of 30 units (5.0 full-course equivalents) selected from the major field of Physics and/or Astrophysics.

Recommendation for both the Major and Honours Programs

Writing Component

It is strongly recommended that a course emphasizing writing skills be included in the program, e.g., a junior English course or Communications Studies 363 or Science 311.

International Component

This suggestion may be satisfied in various ways, e.g., by completing 6 units (1.0 full-course equivalent) from the list of courses in item 4 of the section "Make Your Degree

More International", under "About the University" in the back of the Calendar, or by following one of the other suggestions listed there. If non-science course work is used to satisfy this recommendation, this course work could be part of the breadth requirement.

Suggested Program Sequences

First Year	
Mathematics[1]	Mathematics[1]
Concentration 1	Concentration 1
Concentration 2	Concentration 2
Computer Science[2] 217 or 231 or 235 or option	Computer Science[2] 217 or 231 or 235 or option
Non-science option	Non-science option
Second Year	
Concentration 1	Science 301
Concentration 1	Option
Concentration 2	Concentration 2
Science breadth option	Concentration 1
Non-science option	Non-science option
Third Year	
Science 403	Option
Concentration 1	Concentration 1
Concentration 2	Concentration 1
Option	Concentration 2
Non-science option	Non-science option
Fourth Year	
Option	Science 501[3]
Concentration 1 (400 level or higher)	Concentration 1 (400 level or higher)[4]
Science 502[4]	Science 502[4]
Option	Option
Option	Option

[1]Students should refer to registration materials at the following website (ucalgary.ca/degreeguide/) to determine recommended first-year Mathematics courses based on their concentration.

[2]Computer Science 101 is a non-credit course taught during Block Week prior to Fall Term. It is strongly recommended as preparation for Computer Science 217 or 231. First-year students unable to complete Computer Science 101 should contact the Computer Science Department for supplemental information.

[3]Energy Science Concentrators must take Science 529 instead of Science 501.

[4]Required for Honours, replaced by options in the Major program.

Notes:

1. The schedule is adjustable to accommodate individual programs. Options include any courses that are prerequisite to the concentration courses, but are from another field, and also include the Science Breadth requirements.

2. If Mathematics courses or Computer Science courses are part of a C1 or C2, the number of C1 and C2 slots in this schedule can be reduced accordingly as per degree requirements.

5.6.3.2 Concurrent Degree in Natural Sciences and BEd

Admission

Students accepted into the BSc (NTSC)/BEd concurrent degree program must meet the requirements for admission into the Natural Sciences Program and the departments of their two concentrations. Students will be required to choose two concentrations from Biology, Chemistry or Physics when applying for admission; it is not possible to complete the concurrent degree with the other concentrations offered within the Natural Sciences. Students interested in Mathematics education should consider the BSc (General Mathematics)/BEd concurrent degree program. Students in the concurrent degree program should also consult the information on the program in the Werklund School of Education portion of the calendar

Note: Admission to the program is competitive and meeting the minimum requirements does not guarantee admission. Students interested in the concurrent degree program should consult the Undergraduate Science Centre at the earliest possible opportunity.

Continuation

Students must maintain satisfactory standing in both the Faculty of Science and the Werklund School of Education throughout their degree to remain in the concurrent degree program. For more information, refer to the Faculty Regulations sections of both faculties. All education requirements must be completed at the University of Calgary. Please consult the Werklund School of Education for more full details on the education portion/regulations of the concurrent degree.

Program Structure

The program is divided into a Science portion, which consists of 90 units (15.0 full-course equivalents) and an Education portion, which consists of 60 units (10.0 full-course equivalents). The outline of the concurrent degree is shown in the suggested course sequence below. Students will complete the first two full years (60 units (10.0 full-course equivalents)) in the Faculty of Science. In year 3, students will complete the required education courses (30 units (5.0 full-course equivalents)). In year 4, students will complete all remaining science requirements (30 units (5.0 full-course equivalents)). In year 5, students will complete the remaining courses in the education portion of the degree. Students should consult the Werklund School of Education for complete details of year 3 and 5 of their degree. In the Education portion of the program in Year 5, a project course is required amalgamating Science and Education. This course replaces the 500-level Science project course (Science 501) and an option required in the regular Natural Sciences program.

Science Portion (90 units (15.0 full-course equivalents))

In the Science portion, the following concentrations are possible: Biology, Chemistry and Physics.

The requirements are the same as for the Natural Sciences Major program as specified in the Program Structure except that the 6 units (1.0 full-course equivalents) Natural Science specific course requirements (Science 301, 501) and the 3.0 full-course equivalents) Non-Science options are replaced by:

3 units (0.5 full-course equivalent) - English

3 units (0.5 full-course equivalent) - Education 201

3 units (0.5 full-course equivalent) - Science 403

15 units (2.5 full-course equivalents) - Options

Education Portion (60 units (10.0 full-course equivalents))

For details see the information in the Werklund School of Education portion of the calendar.

Suggested Course Sequence

First Year

1. 3 units (0.5 full-course equivalent) - Education 201
2. 3 units (0.5 full-course equivalent) - English
3. 6 units (1.0 full-course equivalent) - Mathematics[1]
4. 6 units (1.0 full-course equivalent) - Concentration 1
5. 6 units (1.0 full-course equivalent) - Concentration 2
6. 6 units (1.0 full-course equivalent) - Computer Science[2] 217 or 231 or 235 or option

Second Year

1. 3 units (0.5 full-course equivalent) - Open option
2. 3 units (0.5 full-course equivalent) - Science Breadth[3]
3. 12 units (2.0 full-course equivalents) - Concentration 1
4. 6 units (1.0 full-course equivalent) - Concentration 2
5. 6 units (1.0 full-course equivalent) - Option

Third Year

1. Education 420/427
2. Education 430/435
3. Education 440/445
4. Education 450/456
5. Education 460/465

Fourth Year

1. 3 units (0.5 full-course equivalent) - Science 403
2. 9 units (1.5 full-course equivalents) - Concentration 1
3. 3 units (0.5 full-course equivalent) - Concentration 1 at the 400 level or higher
4. 6 units (1.0 full-course equivalent) - Concentration 2
5. 9 units (1.5 full-course equivalents) - Option

Fifth Year[3]

1. Education 520/525

2. Education 530/535
3. Education 540/545
4. Education 550/556
5. Education 560

[1]Students should refer to the Course Registration and Planning Guide to determine recommended first-year Mathematics courses based on their concentration.

[2]Computer Science 101 is a non-credit course taught during Block Week prior to Fall Term. It is strongly recommended as preparation for Computer Science 217 or 231. First-year students unable to complete Computer Science 101 should contact the Computer Science Department for supplemental information.

[3]Refer to the Science Breadth requirement found in 5.6.3.1 Required Courses - Major Program - 4. Science Breadth. A Computer Science course is recommended.

Note: This schedule is somewhat adjustable to accommodate individual programs. Options include any courses that are prerequisite to the concentration courses, but are from another field, and also include the Science Breadth requirements.

5.6.4 Neuroscience

Degrees Offered

Undergraduate
Neuroscience
BSc Honours

Programs Offered

BSc Honours in Neuroscience

Note: There is no Minor offered in Neuroscience.

Program vs. Faculty Regulations

Regulations governing programs in Neuroscience are a combination of general Faculty of Science regulations and the additional program specific regulations listed below. It is essential for students to be familiar with both sets of regulations. It is helpful to read Section 3 (Faculty Regulations) first.

Students are advised to check the Degree Navigator periodically to ensure that all requirements are being met.

Program Information

Program Office: Energy Environment Experiential Learning (EEEL) 426

Telephone: 403.220.8979

Fax: 403.210.8126

Website: ucalgary.ca/bscneuro

Email: bscneuro@ucalgary.ca

Enrolment Limitations

Enrolment Limitations in Program

The number of spaces in Neuroscience program is limited and entry into this program is competitive.

Enrolment Limitations in Courses

In the first instance, enrolment in Neuroscience courses is available to Neuroscience students in satisfactory standing who meet the prerequisite(s). Depending on space availability, other students who are in satisfactory standing and meet the prerequisite(s) may register in a course. Consult the Schedule of Classes for details regarding enrolment in these courses.

Ethics in Neuroscience

Studies in Neuroscience involve the use of living and dead organisms. Students taking laboratory- and field-based courses in this discipline can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Program strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses in the Neuroscience program should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Program Director.

5.6.4.1 Programs in Neuroscience

Admission and Student Standing

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for general regulations regarding admission requirements to the University of Calgary.

Space in the Bachelor of Science Honours in Neuroscience program is limited to 30 students each year. Admission is based on high school averages or university GPA.

New applicants are considered for admission to the first or third years of the Bachelor of Science Honours in Neuroscience degree program only. There is no second year admission. To be eligible for first year admission consideration, applicants must be coming directly from high school and/or presenting no more than 6 units (1.0 full-course equivalent) transferable post-secondary courses (including University of Calgary courses). To be considered for admission to third year, transfer applicants must have completed 60 units (10.0 full-course equivalent) transfer courses and have earned a GPA that meets the standard for admission into an honours program (Section 3.2 Admission and 3.4C Program Requirements). Transfer admission into this program is highly competitive and a GPA of at least 3.70 is required in order to be considered for a transfer, although does not guarantee admission. Students will be evaluated on their academic performance as outlined for the honours review and must have completed or be currently enrolled in the following courses. These courses must include the following or their equivalents:

- Biochemistry 341 or 393
- Biology 241, 243, 311 and 331
- Chemistry 351 and one of 201 or 211 and one of 203 or 213
- One English course
- Mathematics 211 or 213 and one of Mathematics 249 or 265 or 275
- Physics 211 or 221
- Psychology 200 and 312

Additionally, it is recommended that students take Psychology 375 or its equivalent prior to transferring.

Students who have obtained a Bachelor degree in Biological Sciences, Psychology or Zoology, or an equivalent degree, may not enrol in the Bachelor of Science Honours in Neuroscience degree, as Biological Sciences, Psychology and Zoology are integral components of the Bachelor of Science Honours in Neuroscience degree. Students with such degrees are encouraged to seek a second degree in the other discipline (Psychology or Biological Sciences/Zoology, as appropriate) or to consider applying to a graduate degree in Psychology, Biological Sciences or Neuroscience.

Students who hold an approved Bachelors degree recognized by the University of Calgary (BA, BSc, BEd, etc.) in disciplines other than Psychology or Biological Sciences, who wish to pursue the Bachelor of Science Honours in Neuroscience degree as a second or subsequent undergraduate degree are advised that they will be required to follow the admission procedures and meet the requirements in place for transfer applicants to the program. For additional regulations regarding admission to a second undergraduate degree, refer to A.5.5 Second-Degree Students in the Undergraduate Admissions section of this Calendar.

Notes:

- Any student in an Honours program is subject to the provisions for continuation in an Honours program, Subsections 3.2 and 3.4C.

GPA Requirements

Students in Neuroscience must present honours-level performance at the academic review completed after each winter semester. Details on the honours review is found in section A.2 of this calendar. Students who do not qualify for continuation will be moved into the Biological Sciences program in the Department of Biological Sciences unless they indicate otherwise and meet the admission requirements for their chosen program. Students with a GPA of less than 2.000 are subject to the provisions of 3.7 Student Standing, B. Performance Review, Probationary Status and Dismissal.

Note: Students in Neuroscience may take no more than 24 units (6.0 full-course equivalents) that would fulfill major field requirements in Biological Sciences programs or the Psychology program respectively. Students who wish to transfer out of Neuroscience into either Biological Sciences or Psychology must apply to transfer by the application deadline and will be able to take more such courses once admitted to their new program.

Courses Constituting the Honours Field of Neuroscience

- Biology 241, 243, 311 and 331

- Psychology 200 or 205, 312 and 375
- All courses labelled Neuroscience

Required Courses - Honours Program

See also Section 3 (Faculty Regulations), Subsection 3.4A (Program Requirements - Major and Honours Programs) and Subsection 3.5B (Course Selection and Registration - Introductory Courses for Science Degree Programs).

3 units (0.5 full-course equivalent) – Anthropology 201 or 311

3 units (0.5 full-course equivalent) – Biochemistry 341 or 393

12 units (2.0 full-course equivalents) – Biology 241, 243, 311 and 331

9 units (1.5 full-course equivalents) – Chemistry 351 and one of 201 or 211 and one of 203 or 213

3 units (0.5 full-course equivalent) – One English course

3 units (0.5 full-course equivalent) – Mathematics 211 or 213

3 units (0.5 full-course equivalent) – One of Mathematics 249 or 265 or 275

33 units (5.5 full-course equivalents) – Neuroscience 201, 301, 401, 411, 421, 475, 478, 479, 500, 511, 521, 531, 541

3 units (0.5 full-course equivalent) – Physics 211 or 221

3 units (0.5 full-course equivalent) – Philosophy 275 or 279

21 units (3.5 full-course equivalents) – Psychology 200 or 205, 312, 375

6 units (1.0 full-course equivalent) – Zoology 461 and 463

18 units (3.0 full-course equivalents) – Options

Notes:

- Students transferring into the third year of the Neuroscience program can replace Neuroscience 301 with Neuroscience 507.
- Students are advised to register for courses as soon as they are eligible to ensure the best selection. Furthermore, students are advised to follow the course recommendations for each year as many courses serve as prerequisites for subsequent courses.

Recommendations for the Honours Program

Hotchkiss Brain Institute

Throughout their time in the Neuroscience program, students are encouraged to attend seminars at the Hotchkiss Brain Institute. In their fourth year, students must register in Neuroscience 511.

International Component

This suggestion may be satisfied in various ways, e.g., by completing 6 units (1.0 full-course equivalent) from the list of courses in item 4 of the section "Make Your Degree More International," under "About the University" in the Calendar, or by following one of the other suggestions listed there. If non-science course work is used to satisfy this recommendation, this course work could be part of the breadth requirement.

Optional courses

Students typically choose optional courses in consultation with a faculty mentor.

Suggested Program Sequence

First Year		
Biology 241	Biology 243	Neuroscience 301
Chemistry 201[1] or 211 or Physics 211 or 221	Chemistry 203[1] or 213	
Mathematics 211 or 213 or 249 or 265	Mathematics 211 or 213 or 249 or 265	
Neuroscience 201	Philosophy 275 or 279 or Anthropology 201 or Chemistry 201*	
Psychology 200	English	

**Students should take Chemistry 201 in the Winter Term if they are not taking it in the Fall Term.*

Second Year	
Biology 311	Biochemistry 393
Chemistry 351	Biology 331
Psychology 312	Psychology 312
Anthropology 201 or 311 or Philosophy 275 or 279	Psychology 375
Option	Option[2]

Third Year	
Neuroscience 421	Zoology 463
Zoology 461	Neuroscience 401
	Neuroscience 411
Neuroscience 475	Neuroscience 478
Neuroscience 479	Non-science option
Anthropology 201 or 311 or Philosophy 275 or 279	

Fourth Year	
Neuroscience 500	Neuroscience 500
	Neuroscience 511
Neuroscience 541	Neuroscience 521
Option	Neuroscience 531
Non-science Option	Option
	See below[3]

[1]Chemistry 201 and 203 are offered both in Fall and Winter Terms and may be done in any order.

[2]Students who wish to complete a full year of Organic Chemistry may register in Chemistry 353 or 355.

[3]Since students complete Neuroscience 301 in Spring of their first year, this slot is left open.

5.6.4.2 Double Majors including Neuroscience

Programs with two Major fields that include Neuroscience may be completed in the following manner:

- Both Majors must be Honours.
- The minimum requirements for both Major fields must be fulfilled.
- It is not possible to combine Neuroscience with any of Biological Sciences Honours, Psychology Honours or Zoology Honours.

If Neuroscience is combined with another Major in the Department of Biological Sciences, then:

Biology 241, 243, 311, 331 and Biochemistry 393 will be counted towards both Honours. For any other course that is a requirement for both programs that course may be counted towards only one and a substitution must be made to fulfill the requirements of the other Honours field.

For further details consult the Neuroscience Program Student Office.

5.6.4.3 Combined Degrees

It is not possible to undertake a combined Neuroscience degree with a degree in Biological Sciences, Psychology or Zoology. If Neuroscience is combined with another Major in the Department of Biological Sciences (i.e., Biochemistry; Cellular, Molecular & Microbial Biology; Ecology or Plant Biology), then:

Biology 241, 243, 311, 331 and Biochemistry 393 will be counted towards both degrees. For any other course that is a requirement for both programs that course may be counted towards only one and a substitution must be made to fulfill the requirements of the other degree.

5.6.4.4 Minor with Neuroscience

There is no Minor offered in Neuroscience. Students in the Bachelor of Science Honours in Neuroscience may not also minor in Psychology or Biological Sciences, as these programs are already integral components of the Bachelor of Science Honours in Neuroscience degree.

5.7 Physics and Astronomy

Degrees Offered*

Undergraduate Programs**	Core	Enhancements
Physics	BSc	BSc Honours
Astrophysics	BSc	BSc Honours
Chemical Physics[1]	BSc Honours	

**There are many options for graduate studies leading to MSc and PhD degrees in the area of Physics and Astrophysics. Details of graduate specializations can be found in the graduate section of this calendar.*

***All degrees in the Faculty of Science, except Environmental Science, can be combined with eligible BA and BSc programs from the Faculty of Arts. Please refer to Section 3.4 for information on combined degrees, double majors with programs within the Faculty of Science as well as combined degrees with programs from other Faculties. Students interested in pursuing these degrees are encouraged to speak with an advisor in the Undergraduate Science Program to develop a degree completion plan.*

[1]The BSc Honours program in Chemical Physics is undergoing review. Students interested in this program should seek advice from a program advisor in the Undergraduate Science Centre. Students interested in this area should consider completing a double degree or minor.

Programs Offered

BSc in Physics, Astrophysics

BSc Honours in Physics, Astrophysics, Chemical Physics

Minors in Physics and Astrophysics

Department vs. Faculty Regulations

Programs in the Department of Physics and Astronomy are governed by a combination of general Faculty of Science regulations and the additional program specific regulations listed below.

It is essential for students to be familiar with both sets of regulations. It is helpful to read the Faculty Regulations in Section 3 first.

Students should consult the Degree Navigator periodically to ensure that requirements are being met. Also, students are strongly urged to consult the Department at all stages of their program.

Department Information

Department Office: Science B 605

Telephone: 403.220.5385

Fax: 403.289.3331

Website: phas.ucalgary.ca

5.7.1 Programs in Physics

Courses constituting the field of Physics

- All courses labelled Physics except Physics 271, 303 or 371
- Astrophysics 609

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

6 units (1.0 full-course equivalent) - Physics 227 and 255

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 275 or 249 or 265*

3 units (0.5 full-course equivalent) - Mathematics 277, or Mathematics 267* and 177

6 units (1.0 full-course equivalent) - Chemistry 201 or 211 and one of Chemistry 203 or 213 or Biology 241 or Astrophysics 213

3 units (0.5 full-course equivalent) - Computer Science 217

39 units (6.5 full-course equivalents) - Physics 325, 341, 343, 375, 381, 397, 443, 449, 455, 457, 497, 501, and 599 or 598

3 units (0.5 full-course equivalent) - 400- or 500-level Physics option

3 units (0.5 full-course equivalent) - Mathematics 311 or 313

9 units (1.5 full-course equivalents) - Mathematics 375 OR Applied Mathematics 311; and Mathematics 377 OR Mathematics 367; and Applied Mathematics 433

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts.

6 units (1.0 full-course equivalent) - Science options

18 units (3.0 full-course equivalent) - Options

**The recommended sequence for Mathematics courses in Physics and Astronomy is Mathematics 275 and 277. Students who complete Mathematics 267 will have to take a Block Week class for it to be equivalent to Mathematics 277.*

Notes:

- Students who achieve a grade of "A-" or better in Physics 211 or 221 may use either of these courses in place of Physics 227.
- It is strongly recommended that students take 6 units (1.0 full-course equivalent) English to complete the 6 units (1.0 full-course equivalent) Faculty of Arts requirement.
- The Mathematics 275, 277, 375, 377 recommended sequence can be replaced with a sequence of Mathematics 249 or 265, Mathematics 267, Mathematics 177, Applied Mathematics 311, and Mathematics 367.
- Students using only a single chemistry course to fulfill their program requirements may use Chemistry 203 or Chemistry 209 in place of the suggested Chemistry 201 or 211.

Required courses - Honours Program

Same as in Major Program except that Physics 599, 3 units (0.5 full-course equivalent) Physics option, 3 units (0.5 full-course equivalent) Science option and 1.5 full-course equivalents) options are replaced by:

6 units (1.0 full-course equivalent) - Physics 598

12 units (2.0 full-course equivalents) - Physics 451, 481, 543 and 597

Recommendations

It is strongly recommended that Applied Mathematics 217 be taken in preference to Mathematics 249 or 265.

Suggested Program Sequences

(a) Major Program

First Year	
Physics 227	Physics 255
Mathematics 211 or 213	Computer Science 217
Mathematics 275	Mathematics 277
Chemistry 201	Chemistry 203 or Biology 241 or 243 or Astrophysics 213
Non-science option	Non-science option
Second Year	
Physics 341	Physics 325
Physics 397	Physics 343
Mathematics 311 or 313	Physics 381
Mathematics 375	Mathematics 377
Physics 375	Non-science option
Third Year	
Physics 449	Physics 443
Physics 455	Physics 457
Applied Mathematics 433	Physics 497
Option	Option
Non-science option	Non-science option
Fourth Year	
Physics 599 (Physics 598 may be taken instead)	Physics 501
400- or 500-level Physics option	Option
Science option	Science option
Option	Option
Non-science option	Option

(b) Honours Program

First and Second Years Same as for the Physics Major program	
Third Year	
Physics 449	Physics 451
Physics 455	Physics 457
Physics 481	Physics 497
Applied Mathematics 433	Physics 443
Non-science option	Non-science option
Fourth Year	
Physics 598	Physics 598
Physics 543	Physics 501
Physics 597	Option
Science option	Science option
Non-science option	Option

Minor in Physics

- Physics 211 or 221 or 227; and Physics 223 or 255
- 24 units (4.0 full-course equivalents) at the 300 level or higher in the field of Physics
- Mathematics prerequisites as needed

5.7.2 Programs in Astrophysics

Courses constituting the field of Astrophysics

- All courses labelled Astrophysics
- Physics 211, 221, 223, 227, 255, 321, 323, 325, 341, 343, 375, 381, 397, 443, 449, 451, 455, 457, 481, 497, 535, 543, 575, 598, 593, 599

Required Courses - Major Program

See also Section 3 (Faculty Regulations), Subsections 3.4A (Program Requirements - Major Programs) and 3.5B (Course Selection - Introductory Courses).

3 units (0.5 full-course equivalent) - Astrophysics 213

6 units (1.0 full-course equivalent) - Physics 227 and 255

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

3 units (0.5 full-course equivalent) - Mathematics 275 or 249 or 265*

3 units (0.5 full-course equivalent) - Mathematics 277, or Mathematics 267* and 177

3 units (0.5 full-course equivalent) - Chemistry 201 or 211 or 209

3 units (0.5 full-course equivalent) - Computer Science 217

18 units (3.0 full-course equivalents) - Astrophysics 307, 401, 403, 409, 503, 509

24 units (4.0 full-course equivalents) - Physics 325, 341, 343, 375, 381, 443, 449 and 455

6 units (1.0 full-course equivalent) - 400- or 500-level Physics option

3 units (0.5 full-course equivalent) - Mathematics 311 or 313

9 units (1.5 full-course equivalents) – Mathematics 375 OR Applied Mathematics 311; and Mathematics 377 OR Mathematics 367; and Applied Mathematics 433

3 units (0.5 full-course equivalent) - Science options

18 units (3.0 full-course equivalents) - Breadth requirement: Options from Faculties other than the Faculty of Science (check Table I in 3.4 Program Requirements for ineligible courses). Of these 18 units (3.0 full-course equivalents), at least 6 units (1.0 full-course equivalent) must be from the Faculty of Arts.

15 units (2.5 full-course equivalents) - Options

**The recommended sequence for Mathematics courses in Physics and Astronomy is Mathematics 275 and 277. Students who complete Mathematics 267 will have to take a Block Week class for it to be equivalent to Mathematics 277.*

Notes:

- Students who achieve a grade of "A-" or better in Physics 211 or 221 may use either of these courses in place of Physics 227.
- Suggested Physics or Science options are Physics 457, 501, 509, 543, Computer Science 491.
- It is strongly recommended that students take 6 units (1.0 full-course equivalent) English to complete the 6 units (1.0 full-course equivalent) Faculty of Arts requirement.
- The Mathematics 275, 277, 375, 377 recommended sequence can be replaced with a sequence of Mathematics 249 or 265, Mathematics 267, Mathematics 177, Applied Mathematics 311, and Mathematics 367.
- Astrophysics 401/503 and 409/509 are taught in alternate years. It is important that students take these required courses when they are offered to avoid a delay in their graduation.

Required Courses - Honours Program

Same as in Major program, except that 6 units (1.0 full-course equivalent) options, 6 units (1.0 full-course equivalent) 400- or 500-level Physics options, and 3 units (0.5 full-course equivalent) Science option are replaced by:

15 units (2.5 full-course equivalents) Physics 451, 457, 501, 543 and 599.

Suggested Program Sequence

(a) Major Program

First Year	
Physics 227	Astrophysics 213
Mathematics 211 or 213	Physics 255
Mathematics 275	Computer Science 217
Chemistry 201 or 211 or 209	Mathematics 277
Non-science option	Non-science option
Second Year	
Astrophysics 307	Physics 325
Physics 341	Physics 343
Mathematics 311 or 313	Physics 381
Mathematics 375	Mathematics 377
Physics 375	Non-science option
Third Year	
Astrophysics 401 or 503 (whichever is offered)	Astrophysics 403
Physics 449	Physics 443
Physics 455	Astrophysics 409 or 509 (whichever is offered)
Applied Mathematics 433	Option
Non-science option	Non-science option
Fourth Year	
Astrophysics 503 or 401 (whichever is offered)	Astrophysics 507 or 409 (whichever is offered)
400- or 500-level Physics option	400- or 500-level Physics option
Non-Science option	Science option
Option	Option
Option	Option

(b) Honours Program

First and Second Years Same as for the Physics Major program	
Third Year	
Astrophysics 401 or 503 (whichever is offered)	Astrophysics 403
Physics 449	Physics 451
Physics 455	Physics 457
Applied Mathematics 433	Physics 443
Non-science option	Astrophysics 409 or 509 (whichever is offered)
Fourth Year	
Astrophysics 503 or 401 (whichever is offered)	Astrophysics 509 or 409 (whichever is offered)
Option	Physics 501
Physics 543	Physics 599
Option	Option
Non-science option	Non-science option

Minor in Astrophysics

3 units (0.5 full-course equivalent) - Astrophysics 213

15 units (2.5 full-course equivalents) - Courses labelled Astrophysics

12 units (2.0 full-course equivalents) - Physics 227*, 255*, 325, 341*

3 units (0.5 full-course equivalent) - Mathematics 211 or 213

9 units (1.5 full-course equivalents) - Mathematics 265** or 275 or 249; Mathematics 277, or Mathematics 267** and 177; Mathematics 375 or Applied Mathematics 311

3 units (0.5 full-course equivalent) - Computer Science 217

**The sequence Physics 211 or 221, 223, 321 and 323 may be substituted for the sequence Physics 227, 255 and 341.*

***The recommended sequence for Mathematics courses in Physics and Astronomy is Mathematics 275 and 277. Students who complete Mathematics 267 will have to take a Block Week class for it to be equivalent to Mathematics 277.*

5.7.3 Chemical Physics Program (Honours)

This program is offered in conjunction with the Department of Chemistry. Details about the program are given under 5.2 Chemistry.

5.7.4 Environmental Science - Physics Concentration

Students may pursue a BSc program in Environmental Science with a concentration in Physics. This is a single-degree, four-year program which is offered by the Faculty of Science with collaboration from the Faculty of Arts. Program details are listed in 5.6 Non-Departmental Programs. Since this is a multidisciplinary program with restricted entry, students should consult the Director of the Environmental Science program at their earliest opportunity.

Faculty of Social Work

Table of Contents

1. Summary of Degree Programs

Degrees Offered

Undergraduate
BSW
Graduate
MSW
PhD

Undergraduate

Bachelor of Social Work (BSW)

The Faculty of Social Work provides post-secondary education throughout Alberta. The BSW degree, accredited by the Canadian Association for Social Work Education, is offered from the Faculty's home location in Calgary, the Edmonton-based Central and Northern Alberta Region, and the Lethbridge-based Southern Alberta Region. The BSW is also offered by blended learning in communities around the province through the community-based Learning Circles and by distance learning through the Virtual Learning Circles.

The undergraduate social work curriculum is delivered face-to-face in Calgary, Edmonton and Lethbridge and in some of the community-based Learning Circles sites. The Virtual Learning Circles program is delivered primarily online with some face-to-face course work at the University of Calgary campus.

The BSW program in Calgary, Edmonton, and Lethbridge prepares students for generalist practice. There are no specializations at the BSW level.

The community-based Learning Circles curriculum prepares students for practice that is geographically relevant and particularly sensitive to the needs of First Nations and Métis peoples.

The Learning Circles program is administered from Edmonton for sites in central and northern communities, and from Lethbridge for sites in southern communities. The Virtual Learning Circles program is administered from Calgary.

Students may study for the BSW degree on a full-time or part-time basis. Students have up to five years to complete the 3rd and 4th year of the BSW program.

The Faculty of Social Work's admission routes into its different programs are described in the section 3.1 Admissions.

Graduate

Master of Social Work (MSW)

The Faculty offers a Master's program accredited by the Canadian Association for Social Work Education leading to the MSW degree. The objective of the MSW program is to prepare students for advanced professional practice in social work. The Faculty of Social Work offers MSW programs in Calgary, Edmonton, and Lethbridge. In all locations, students choose between the course-based or the thesis route to the degree.

In Calgary, MSW students are admitted annually and choose from one of the three Specializations: Clinical Social Work Practice, Leadership in the Human Services, or International and Community Development. Students without an undergraduate degree in social work must complete nine Foundation courses prior to taking any Specialization courses. BSW graduates are admitted directly into the Specialization route.

In Edmonton, the Faculty of Social Work offers only the Clinical Social Work Practice Specialization. Students without an undergraduate degree in social work must complete nine Foundation courses prior to taking any Specialization courses. BSW graduates are admitted directly into the Specialization route.

In Lethbridge, the Faculty of Social Work offers only the Clinical Social Work Practice Specialization and only to students with a BSW. Lethbridge does not offer the Foundation route.

The course-based MSW in Leadership in the Human Services Specialization is administered through Calgary as a distance program and is accessible to students regardless of home location.

More details about the MSW program may be found in the Faculty of Graduate Studies Calendar at grad.ucalgary.ca.

Doctor of Philosophy (PhD) in Social Work

The PhD program offers a research-based degree and is intended to produce highly qualified social work researchers and teachers. It is Calgary-based.

Please consult the Faculty of Graduate Studies Calendar for further information: grad.ucalgary.ca.

MSW/MBA

The Faculty of Social Work and the Haskayne School of Business offer a combined program leading to the Master of Social Work/Master of Business Administration (MSW/MBA) degree. Offered from the Calgary location, this program is designed to prepare students for business-related social work careers.

Post-baccalaureate Certificate and Diploma

A Post-baccalaureate Certificate and Diploma in Mental Health and Addictions is offered in Calgary. Information about this program can be obtained from the Student Services Office in the Faculty of Social Work or from the Faculty's website at: fsw.ucalgary.ca/.

2. Faculty Information

Contact Information

Location: Professional Faculties 3256

Student Information: 403.220.2011/5430

Dean's Office: 403.220.5945

Dean's Office Email: browna@ucalgary.ca

Student Services Email: socialwk@ucalgary.ca

Website: fsw.ucalgary.ca

Additional Information

Students interested in pursuing the BSW in Calgary or through the BSW Virtual Learning Circles program must contact:

Student Services

Faculty of Social Work, University of Calgary

2500 University Drive N.W.

Calgary, Alberta

T2N 1N4

Telephone: 403.220.2011/5430 or toll free 1.877.282.0667

Email: bswinfo@ucalgary.ca

The BSW is consistently offered in Edmonton. In addition, Central and Northern Alberta communities currently hosting the BSW Learning Circles program are: Grande Prairie, Red Deer and Peace River.

Students interested in studying in the Central and Northern Alberta Region must contact:

Student Services

Faculty of Social Work, University of Calgary

Central and Northern Alberta Region

#444, 11044-82 Avenue

Edmonton, Alberta

T6G 0T2

Telephone: 780.492.3888 or toll free 1.888.492.2083

Email: fswcnar@ucalgary.ca

The BSW program is consistently offered in Lethbridge. The Southern Alberta commu-

nity currently hosting the Learning Circles program is Medicine Hat.

Students interested in studying in Southern Alberta Region must contact:

Student Services

Faculty of Social Work, University of Calgary

Southern Alberta Region

4401 University Drive, University Hall Room 526

Lethbridge, Alberta

T1K 3M4

Telephone: 403.329.2794 or toll free 1.866.329.2794

Email: fswsar@ucalgary.ca

Introduction

International Definition of Social Work

The social work profession promotes social change, problem solving in human relationships and the empowerment and liberation of people to enhance well-being. Utilizing theories of human behaviour and social systems, social workers intervene at the points where people interact with their environments. Principles of human rights and social justice are fundamental to social work.

Faculty of Social Work Vision

Creating social well-being and just societies.

Faculty of Social Work Mission

- Dedicated to promoting societies that respect human dignity and worth, meet basic human needs, are anti-oppressive, inclusive, and based on principles of social justice.
- Committed to learners by providing and building a knowledge base and set of skills in environments designed to stimulate and support a spirit of critical inquiry.
- Focused on serving as a catalyst for positive community impact through the creation and dissemination of knowledge and innovation.

Objectives

The Faculty of Social Work prepares BSW graduates to address individual, family, community, and social concerns in the context of diverse and changing societies. Graduates are prepared to draw upon a variety of assessment and intervention methods to help achieve social well-being outcomes with appropriate structural supports across the life span.

The program is based on the social work tenets of mobilizing strengths of individuals and groups, social engagement and civil societies, respect for diversity, inclusion, equitable participation, and social justice.

The program is grounded in the vision and mission of the Faculty, inquiry-based methods of learning, the Codes of Ethics and Standards of Practice of the social work profession, and the national accreditation standards for schools of social work.

Opportunities

The BSW program provides the student with the professional knowledge, theory, and skills of social work including a wide range of experiential opportunities to integrate this learning in supervised practice settings. Upon graduation, students are prepared to practice as generalist social workers in a wide variety of social welfare fields in a continuously changing world. Areas of practice may include child welfare, family violence, community development, mental health, gerontology, social policy development, and working with individuals, families, groups, organizations, and communities.

Social Work Students' Association

The Social Work Students' Association (SWSA) is actively involved in the governance of the Faculty, with representatives on Faculty Council and Faculty committees. The society is an active advocate of student interests and issues, and a sponsor of fundraising social events for charitable causes. The Association is active in all regions and all students in the faculty are eligible for membership.

Code of Conduct

The study of social work practice places students in a position of special trust with professional social workers and their clients. The Faculty recognizes that social work education occurs both inside and outside the classroom and has the responsibility to ensure that its graduates are competent and ethical. A student's impaired judgment or non-academic misconduct may be grounds for determining whether the student should continue in the program, with or without conditions, or be dismissed from the Faculty of Social Work.

Criteria

The following examples illustrate situations in which, in particular circumstances, a student may be assessed as being unsuitable for professional social work education at this time. The list is not exclusive of other forms of misconduct:

- Concealment or distortion of the truth on the Application for Admission to the Faculty of Social Work or the University of Calgary.
- Persistent and/or serious conduct that contravenes the University of Calgary Statement on Principles of Conduct.
- Persistent and/or serious unethical behaviour as defined by the Canadian Association For Social Work Education Code of Ethics, 2005 and the Alberta College of Social Work Standards of Practice, 2013. Such unethical behaviour includes (but is not limited to):

(a) Persistent and/or serious medical condition that affects the student's ability to perform as a social worker if that condition negatively affects judgment and interferes with the ability to function within a professional context;

(b) Persistent substance abuse (e.g., alcoholism, drug addiction, use of illegal drugs) that interferes with the ability to function within a professional context;

(c) Criminal behaviour (i.e., arrests and convictions for such crimes as physical assault, sexual assault, drug trafficking) that interferes with the ability to function within a professional context;

(d) Persistent and or/serious conduct that contravenes the policies of the practicum setting (applies to students in practicum);

(e) Imposing stereotypes on a client, including behaviour, values, or roles related to race, ethnicity, religion, marital status, gender, sexual orientation, age, socio-economic status, income source or amount, political affiliation, disability or diagnosis, or national origin, that would interfere with the provision of professional services to the client; and

(f) Persistent and/or serious inability to form a professional, helping relationship.

3. Faculty Regulations

3.1 Admissions

Applicants must meet the basic University admission requirements. Students who lack university admission requirements cannot be admitted to the Faculty. In addition, applicants must have a minimum grade point average of 2.30 calculated over the most recent course work to a maximum of 30 units (5.0 full-course equivalents) of University of Calgary courses and/or transfer courses taken at other institutions. All grades within a term will be included except where the number of courses taken within a term exceeds 30 units (5.0 full-course equivalents), in which case, the highest grades will be used.

Students are admitted to the Fall Term only.

Admission quotas limit enrolment in each of the routes. Therefore, not all qualified applicants may be admitted.

Applicants must submit both a completed Faculty of Social Work Application for Admission form and the online University of Calgary Application for Admission. Continuing students at the University of Calgary must submit a completed Faculty of Social Work Application for Admission form and fill out the Change of Program request through their Student Centre by the deadline dates specified below. All applicants must also provide two reference letters (one of which must be academic), required essay, and information on relevant volunteer/work experience to the Faculty of Social Work. Admission requirements for part-time students are the same as those listed for full-time students.

Applicants can only apply to one location. Applicants who wish to switch their location choice (e.g. from Calgary to Edmonton or Lethbridge) must contact the Student Services Office prior to March 1. Requests for change will be considered at the discretion of the Faculty.

Application Deadlines

Application and documentation deadlines for the Bachelor of Social Work program:

Standard admission: March 1.

University of Calgary Change of Program applicants: February 1.

Also refer to the Prospective Students link at: ucalgary.ca/prospectivestudents/.

The following categories of applicants to the University of Calgary must complete the regular University of Calgary "Application for Admission/Readmission" form:

(a) Not previously attended

(b) Attended as a Visiting or Open Studies student

(c) Attended another institution since leaving

(d) Not attended for two years or more

University Transfer Route

The University Transfer route is available in Calgary, Edmonton, Lethbridge, Learning Circles, and Virtual Learning Circles. University Transfer applicants must have completed a minimum of 60 transferable units (10.0 full-course equivalents), 57 units (9.5 full-course equivalents) of which are non-social work courses plus Social Work 201 or its equivalent. All courses must have been completed by the end of the Winter Term preceding the Fall Term for which entry is sought. Winter, Spring and Summer courses taken in the terms immediately preceding admission will not be used in the calculation of the GPA. However, applicants must successfully complete their Winter courses and must maintain a GPA sufficient to satisfy the University admission requirements.

Social Work 201 is a prerequisite for admission into the University Transfer Route and must be completed prior to admission.

The Faculty of Social Work evaluates applications on the following criteria:

1. Grade Point Average. The grade point average is calculated on the most recently completed 30 units (5.0 full-course equivalents), starting with courses completed prior to the application deadline.

2. Relevant work/volunteer experience.

3. Admission essay.

4. Two letters of reference. One of these should be from an academic source (e.g., previous instructor). The other should be from a professional (e.g., a former employer or supervisor) who is qualified to comment on the applicant's suitability for undergraduate studies in social work.

Note: Applicants wishing to take the complete BSW degree program at the University of Calgary may complete their 57 non-social work units (9.5 full-course equivalents) from the required 60 units (10.0 full-course equivalents) for admission, via the Faculty of Arts.

After-Degree Route

The After-Degree route is available in Calgary, Edmonton, Lethbridge, Learning Circles, and Virtual Learning Circles. Those who have completed a four-year undergraduate degree from an accredited post-secondary institution may apply to the BSW University Transfer route.

Social Work 201 is a prerequisite to admission into the After-Degree route and must be completed prior to admission. Please contact the Student Services Office for possible transfer equivalencies.

Applicants are evaluated on the following criteria:

1. Grade point average composed of an acceptable undergraduate degree from an accredited institution with a competitive GPA as calculated on the most recently completed 30 units (5.0 full-course equivalents);

2. Relevant work/volunteer experience;

3. Admission essay;

4. Two letters of reference. One of these should be from an academic source (e.g., previous instructor). The other should be from a professional (e.g., a former employer or supervisor) who is qualified to comment on the applicant's suitability for undergraduate studies in social work.

Note: Applicants with a complete non-Social Work four-year degree and with the equivalent of two years of paid or volunteer work experience in the human services may consider applying to the two year MSW program. Applicants are strongly encouraged to consult with Student Services in the Faculty of Social Work prior to submitting an application to the MSW program.

Alberta Social Work Diploma Route

The Alberta Social Work Diploma route is available in Calgary, Edmonton, Learning Circles and Virtual Learning Circles.

Note: Admission to the Alberta Social Work Diploma route in Lethbridge may be available subject to faculty permission.

Students who will have completed a Social Work Diploma at an Alberta Community College or University that has a transfer agreement with the Faculty of Social Work may apply for admission to the BSW Alberta Social Work Diploma route. Such applicants must also meet basic University admission requirements. Applicants not meeting University basic admission requirements cannot be admitted to the Faculty.

Applicants to the Alberta Social Work Diploma route will receive credit for 60 units (10.0 full-course equivalents) from their Diploma program. In order to be considered for admission, students must have completed a minimum of 24 units (4.0 full-course equivalent) university transfer non-Social Work courses (normally as part of the Social Work program).

Note: Students who have graduated with a Social Work Diploma from a College that does not have an agreement with the Faculty of Social Work, will normally receive credit for 30 unspecified units (5.0 full-course equivalents) which will include Social Work 201, from their Diploma program.

The Faculty of Social Work evaluates applications on the following criteria:

1. Grade Point Average. The cumulative grade point average achieved on the Social Work Diploma will be used. For students still working on their Diploma the cumulative GPA will be calculated on the most recently completed courses, starting with the Fall Term prior to the expected admission date.

2. Admission essay.

3. Relevant volunteer/work experience.

4. Two letters of reference. One of these should be from an academic source (e.g., previous instructor). The other should be from a professional (e.g., a former employer or supervisor) who is qualified to comment on the applicant's suitability for undergraduate studies in social work.

Second Baccalaureate Degree

Students who have received one or more approved undergraduate degrees (BA, BSc, BEd, etc.) may apply for admission to programs leading to a Second Baccalaureate Degree with a Major Field or a Second Baccalaureate Degree program with Honours in a Major Field.

Students must apply to the Admissions Office and submit the Faculty of Social Work Application for Admission form and all the required supplementary documents by the application deadline. For more information regarding admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions.

3.2 Registration

Course Load

The normal course load is 15 units (2.5 full-course equivalents) per term.

Accuracy of Registration

All students are responsible for the completeness and accuracy of their registration and for arranging their course selections to meet all program requirements as detailed in this Calendar.

Transfers Between Locations for Students Already in Program

Students already in the program who wish to transfer to another location must apply for transfer by February 1 for the following Fall. Students must:

1. Discuss the possibility of transfer with faculty advisors from both the location they wish to leave and the location they wish to transfer to. The decision will be made through consultation between the program directors and field co-ordinators at the two locations.

2. Complete a Change of Program request via their Student Centre; and

3. Fill out the Intra-Faculty Transfer Request form available through divisional offices.

Interruption of Program Leading to a Degree

Students who interrupt their degree program in the Faculty of Social Work are advised that after an absence of one calendar year (twelve consecutive months) from academic study at the university level, they may be required to comply with any regulations that may have come into effect in regard to their program requirements during their absence. Students who choose not to attend for a year (twelve consecutive months) will not be required to re-apply for admission. However, they must notify the Faculty of Social Work in writing by February 1 of their intention to return the following Fall. Students who interrupt their degree program for two or more

years (twenty-four consecutive months) will be required to re-apply for admission. Students who are required to withdraw for academic reasons will not normally be readmitted.

Other Requirements

Most courses have a web-based component. In order to take advantage of this, students must be familiar with navigating the Internet and have access to a computer. Some courses may be available only online or by video-conferencing. Email is routinely used to disseminate information to students. An email address is required for full participation in courses and Faculty life. Calgary, Edmonton, and Lethbridge provide limited space in computer laboratories.

3.3 Course Work

Field Practicum

Field practicum courses provide an opportunity for the student to be directly involved in social work practice. Successful completion of these courses is a requirement for continuation in the program. In all BSW program routes, students are required to complete a number of 300-level Social Work courses before registering in field practica. Students are advised to review the curriculum plan specific to their route.

The field practicum courses are Social Work 410 and 412. All continuing students planning to enrol in the field practicum courses must register in the appropriate course(s). Students will be assigned placements in the field practicum based on availability and student interest and choices made by agencies. Information on field placement arrangements, including international placements, is available from the Director of Field Education.

Students are expected to be in practicum for a specific number of hours per week for the duration of their scheduled term. The practicum represents a significant time commitment. Students are expected to plan accordingly to be able to dedicate the number of hours required to complete their practicum within the appropriate terms.

Notes:

- Students must maintain concurrent registration in practica and related integrative seminars (that is, the practicum Social Work 410 must be taken at the same time as the integrative seminar Social Work 411 and the practicum Social Work 412 must be taken at the same time as the integrative seminar Social Work 413).
- Students registered in the field practicum courses, Social Work 410 and 412, are required to attend the practicum during Reading Days in the Fall Term but not during Reading Week in the Winter Term. Students should also note that Social Work practicum courses will normally run one week past the last day of lectures in Fall and Winter Terms.

Police Information Check

Students are advised that many agencies that offer social work practicum placements require a current Police Information Check (PIC) prior to acceptance into a placement. The placement agency has the discretion to refuse a placement based on a Police Information Check. Registration with the Alberta College of Social Workers (ACSW) also requires a Police Information Check. Students who are concerned about the presence of a criminal record should contact the police department to discuss the process for eliminating or erasing such a record. Students are obligated to inform the Faculty immediately of any change in status of their criminal record. Alberta Health Services (AHS) requires the Faculty of Social Work to document a PIC for all students placed in AHS practica.

Student Advising

The Faculty of Social Work Student Services Offices in Calgary, Edmonton and Lethbridge advise students on academic matters and University regulations. Students can drop-in or book an appointment with Student Services staff through the online booking system.

3.4 Student Standing

Promotion and Graduation Requirements

1. Academic performance and professional suitability (see Code of Conduct) will be monitored throughout the program and assessed at the end of each Winter Term.

2. Once admitted to the BSW program, students are allowed a maximum of 6 units (1.0 full-course equivalent) of "D" or "D+" grades within their program.

3. A student who fails or withdraws from a field practicum course (Social Work 410 or 412) will fail or be required to withdraw from the corequisite courses (Social Work 411 and 413). In addition, the student may be required to withdraw from the program. Normally, students may register in practicum courses a maximum of two times.

4. A cumulative grade point average of 2.30 or above is required on all courses taken towards the BSW degree. Normally, a student who has obtained a cumulative GPA of at least 2.00 but less than 2.30 will be placed on academic probation. Students whose cumulative GPA falls below 2.00 will be required to withdraw.

5. Students who are required to withdraw from the Faculty of Social Work will not normally be readmitted.

6. A maximum of 6 units (1.0 full-course equivalent) of Social Work courses will be allowed for transfer credit.

To be awarded the Bachelor of Social Work degree from the University of Calgary, students must meet all program requirements as described under 4. Program Details. All students must complete a minimum of 30 units (5.0 full-course equivalents) at the University of Calgary to obtain a degree from this institution. In the case of a student repeating a required course, the GPA for graduation purposes (not degrees with distinction) shall include only the higher grade.

Minor Field Programs

Students may formally declare a Minor Field and have this officially recorded on their transcript of record provided they satisfy the requirements for the relevant Minor Field program. This declaration must be made no later than the time of their last registration.

Minor Fields may be taken from Continuing Education and the Faculties of Arts, Education, Medicine, Science, and the Haskayne School of Business. Students must satisfy the Minor Field requirements of the relevant Faculty.

Graduation "With Distinction"

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of all BSW students whose grade point averages on University of Calgary Social Work graded courses places them in the top 10 per cent of the Faculty's graduates. A minimum GPA of 3.60 will be required.

3.5 Timeline for Program Completion

Degree requirements for all students must be completed within five consecutive 12-month periods from the date of initial registration in the Faculty of Social Work.

4. Program Details

4.1 BSW Routes (Calgary, Edmonton, Lethbridge)

4.1.1 University Transfer Route

Students are required to complete a total of 60 units (10.0 full-course equivalents) in the following configuration:

- 51 units (8.5 full-course equivalents) of Social Work required courses, including: Social Work 355, 361, 363, 365, 371, 383, 391, 393, 395, 397, 399, 410, 411, 412, 413; and
- 9 units (1.5 full-course equivalents) of Social Work elective courses at the 500 level.

Note: All required 300-level Social Work courses must be completed prior to registering in Social Work 410 or 412.

4.1.2 After-Degree Route

Students are required to complete a total of 60 units (10.0 full-course equivalents) in the following configuration:

- 51 units (8.5 full-course equivalents) of Social Work required courses, including: Social Work 355, 361, 363, 365, 371, 383, 391, 393, 395, 397, 399, 410, 411, 412, 413; and
- 9 units (1.5 full-course equivalents) of Social Work elective courses at 500 level.

Note: All required 300-level Social Work courses must be completed prior to registering in Social Work 410 or 412.

4.1.3 Alberta Social Work Diploma Route

Students are required to complete a total of 60 units (10.0 full-course equivalents) in the following configuration:

- 24 units (4.0 full-course equivalents) of Social Work required courses, including: Social Work 355, 361, 363, 365, 371, 412, 413;
- 9 units (1.5 full-course equivalents) of Social Work courses at 500 level;
- 24 units (4.0 full-course equivalents) of non-Social Work courses; and
- 3 units (0.5 full-course equivalent) of either 500 level Social Work or non-Social Work course.

Notes:

- All required 300-level Social Work courses must be completed prior to registering in Social Work 412.
- All required non-Social Work courses will normally be completed prior to registering in Social Work 412.
- If students have completed additional University of Calgary transferable courses outside those required for the Diploma, it is the student's responsibility to request the transfer of credits for those additional courses.

4.2 Learning Circles

Introduction

The Faculty of Social Work offers two BSW Learning Circles programs, namely the community-based Learning Circles and the Virtual Learning Circles. These programs provide an undergraduate curriculum that is culturally and geographically relevant. Course content is innovative and aligned with traditional philosophies and knowledge systems. Community collaboration and flexible delivery methods are key features of these programs.

Students in the BSW community-based Learning Circles program must be available to attend course offerings in Alberta communities where the community-based Learning Circles are being offered.

The BSW Virtual Learning Circles program delivers the curriculum through a blended learning approach, integrating online learning with some face-to-face classes in Calgary. Students must have reliable online access and be able to travel to Calgary for an annual 5-day residency in both years. For more information on the BSW Virtual Learning Circles program consult the Student Services Office in Calgary or the Faculty's web page: fsw.ucalgary.ca.

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for regulations regarding University admission requirements.

Core content in the Learning Circles curriculum is grouped into four theme areas:

Generalist Practice in Context (Social Work 300, 301)

Research in Context (Social Work 302, 303)

Diversity and Oppression (Social Work 304, 305)

Social Work Methods (Social Work 306, 307)

Each theme area is comprised of 9 units (1.5 full-course equivalents), including one theme course (6 units or 1.0 full-course equivalent) and one additional 3 unit course (0.5 full-course equivalent). Students can complete the four theme areas over two academic years.

These form the basis for courses that are listed as Social Work 300-level courses (Social Work 300, 301, 302, 303, 304, 305, 306, and 307). Courses related to local practicum placements are listed as Social Work 400-level courses (Social Work 410, 411, 412 and 413). Social work option courses for community-based Learning Circles and Virtual Learning Circles students have the same 500-level designation as option courses for the students in Calgary, Edmonton and Lethbridge.

Notes:

- Social Work 300, 301, 302, 303, 304, 305, 306, and 307 cannot be taken by students in Calgary, Edmonton and Lethbridge.
- Social Work option courses may be taken at any time in the program.

4.2.1 Learning Circles University Transfer Route

Students are required to complete a total of 60 units (10.0 full-course equivalents) in the following configuration:

- 54 units (9.0 full-course equivalents) of Social Work required courses, including: Social Work 300, 301, 302, 303, 304, 305, 306, 307, 410, 411, 412, 413; and
- 6 units (1.0 full-course equivalent) of Social Work elective courses at the 500 level.

Note: With prior approval of the Faculty of Social Work, University Transfer students may take Social Work 410 (Practicum I) and 411 (Integrative Seminar I) in their final semester of required social work theme courses. Upon completion of Social Work 410 and 411, University Transfer students may take Social Work 412 (Practicum II) and 413 (Integrative Seminar II).

4.2.2 Learning Circles After-Degree Route

Students are required to complete a total of 60 units (10.0 full-course equivalents) in the following configuration:

- 54 units (9.0 full-course equivalents) of Social Work required courses, including: Social Work 300, 301, 302, 303, 304, 305, 306, 307, 410, 411, 412, 413; and
- 6 units (1.0 full-course equivalent) of Social Work elective courses at the 500 level.

Notes:

- With prior approval of the Faculty of Social Work, University Transfer students may take Social Work 410 (Practicum I) and 411 (Integrative Seminar I) in their final semester of required social work theme courses. Upon completion of Social Work 410 and 411, University Transfer students may take Social Work 412 (Practicum II) and 413 (Integrative Seminar II).
- Students who completed a four-year undergraduate degree and possess the equivalent of two years of full-time paid or volunteer work experience in the human services field may consider applying to the MSW program through the Foundation Route. They are strongly encouraged to consult with Student Services in the Faculty of Social Work to determine the appropriate program for application.

4.2.3 Learning Circles Alberta Social Work Diploma Route

Students are required to complete a total of 60 units (10.0 full-course equivalents) in the following configuration:

- 45 units (7.5 full-course equivalents) of social work required courses, including: Social Work 300, 301, 302, 303, 304, 305, 306, 307, 412, 413; and
- 15 units (2.5 full-course equivalents) of non-Social Work courses.

Notes:

- All required 300-level Social Work courses and non-Social Work courses must be completed prior to registering in Social Work 412.
- All required non-Social Work courses will normally be completed prior to registering in Social Work 410 or 412.

4.3 Interprofessional Health Education

The Faculties and Departments of Education, Medicine, Nursing, Social Work, Community Rehabilitation and Disability Studies, and Psychology, along with Alberta Health Services, jointly sponsor courses in Interprofessional Health Education (IPHE). The courses provide the foundation for sound and evidence-informed interprofessional practice in the fields of health, mental health, and addictions where comorbidity is common. Interprofessional Health Education (IPHE) 501 and 503 may be taken by Social Work undergraduate students and credited either as a 500-level Social Work option OR as a non-Social Work option.

5. Administration

Faculty Administrative Officers

Dean

J.D. Sieppert

Associate Deans,

R. Enns, Central and Northern Alberta Region

C. Walsh, Research and Partnerships

H. Coleman, Southern Alberta Region

E. Perrault, Teaching and Learning

Directors

L. Jaques, Graduate Programs

H. Ngo, Undergraduate Programs

Faculty of Veterinary Medicine

1. Summary of Degree Programs

Degrees Offered

Undergraduate
Professional
DVM
Graduate
MSc
PhD

Doctor of Veterinary Medicine

The Faculty of Veterinary Medicine offers a four-year professional degree leading to a Doctor of Veterinary Medicine (DVM). Completion of at least two years of post-secondary instruction at a recognized university or at a college providing university-equivalency in coursework is required prior to application to the DVM program. Please refer to Admissions under the Faculty Regulations section for further details.

Graduate

Graduate work supervised by members of the Faculty of Veterinary Medicine leading to the Master of Science (MSc) and Doctor of Philosophy (PhD) degrees is offered under the administration of the Faculty of Graduate Studies. Graduate degrees are linked to research conducted in basic biomedical, clinical, population and public health or related disciplines. The Veterinary Medical Sciences graduate program is designed specifically for animal health related research. Details of specific programs appear in the Faculty of Graduate Studies Calendar and on the Faculty website. Post-DVM clinical training positions are also available.

2. Faculty Information

Contact Information

Location: Teaching Research & Wellness Building, 2nd floor, Foothills Campus

Student Information:

General Inquiries: 403.210.3961

DVM Admissions Inquiries: 403.220.8699

Graduate Studies Admission Inquiries: 403.210.6628

Clinical Training Programs Inquiries: 403.210.6116

Faculty Number: 403.210.3961

Email addresses:

General Inquiries: vetmed@ucalgary.ca

Dean's Office: vetdean@ucalgary.ca

DVM Admissions Inquiries: vet.admissions@ucalgary.ca

Graduate Studies Admission Inquiries: vmgrad@ucalgary.ca

Website: vet.ucalgary.ca/

Introduction

The University of Calgary Faculty of Veterinary Medicine (UCVM) offers an accredited program leading to a Doctor of Veterinary Medicine (DVM) degree and eligibility for licensure in North America. UCVM also offers graduate education and advanced clinical training programs. The DVM program is offered and administered by the Faculty of Veterinary Medicine. Graduate studies under the supervision of UCVM faculty members are administered through the Faculty of Graduate Studies.

The Mission of the Faculty is to meet the veterinary, animal, and public health needs of Alberta through:

- Excellence in delivery of a comprehensive undergraduate veterinary medical education, emphasizing production animal health, ecosystem and public health, equine health and investigative medicine;
- Excellence in clinical, diagnostic and professional teaching and service, in collaboration with our partners in the Distributed Veterinary Learning Community;
- Excellence in the creation and distribution of new knowledge through research, graduate veterinary education, and continuing education in animal health, disease, and welfare, and its relation to human health.

Our education, research and service activities will contribute to the promotion and protection of animal and human health and welfare in Alberta, Canada and internationally.

Pattern

The DVM program is accredited by the AVMA-CVMA (American and Canadian Veterinary Medical Associations) Council on Education and is based on an integrated core-elective model. The core program provides a comprehensive general veterinary education covering all the major domestic species, including food producing animals, equine and companion animals, and the major exotic animal species. The core program also includes public and ecosystem health, wildlife and conservation medicine, professional and communication skills, research skills and comparative medicine. The core program prepares students for general veterinary practice, with an emphasis on skills for successful practice in rural communities and provides a foundation to pursue all careers in veterinary medicine. The elective programs cover all areas of general veterinary practice and provide enhanced opportunities in four Areas of Emphasis:

- **Production animal health:** population and individual animal health of all food and other production animal species; educating veterinarians to meet the needs of the livestock industry and rural Alberta.
- **Ecosystem and public health:** animal and public health at the interface of domestic animals, wildlife, humans and the environment; educating veterinarians to meet the needs of society through public and private practice in areas related to public health, food safety, environmental and agricultural interfaces, wildlife/conservation/zoo medicine and health.
- **Equine health:** population and individual care of horses; educating veterinarians to meet the needs of the horse industry, horse owners, and rural Alberta.
- **Investigative Medicine:** comparative medicine and biomedical research; encouraging students to pursue careers advancing animal and human health through research (basic, clinical, applied, or population health).

The DVM program is delivered over four calendar years and includes nine semesters of instruction. The first three years are two semesters in length and follow the University academic calendar. They include on-campus and off-campus learning experiences. A number of extracurricular learning activities are also available. The fourth (practicum) year is the equivalent of three semesters - 40 weeks of practicum rotation experiences, plus two additional weeks for assessment, delivered over a full calendar year. Through our Distributed Veterinary Learning Community (DVLC) students will gain valuable hands-on clinical, diagnostic and professional experience in the fourth year of the

program. The DVLC is comprised of private and public practices, non-government organizations, federal and provincial agencies and other animal industry partners who work with UCVM faculty to provide an exciting collaborative environment and outstanding learning opportunities for our DVM students.

The DVM curriculum provides a balance of opportunities for students to learn comparative medicine and discipline-based knowledge, to acquire and practice clinical and professional skills, and to develop diagnostic reasoning ability during the first three years. Early exposure to clinical material at the individual animal and population levels is provided in the Clinical Presentations courses, which integrate basic, preclinical, clinical and population health material.

Clinical skills courses offered in each semester of the first three years enable students to have early and frequent contact with animals, where they learn and practice clinical skills necessary for the practicum year. Professional Skills courses in each of the first three years cover clinical communications, ethics, jurisprudence, business operations, informatics, and research.

Delivery of final year practicum rotations through the DVLC provides a wealth of clinical and professional experiences, preparing students for the broad range of career opportunities available within the veterinary profession. The Distributed Veterinary Teaching Hospital gives students access to a large case load that includes a significant proportion of primary care cases, in addition to more complex cases. Scheduling of the final year over 12 months provides opportunity to capture seasonality in clinical experiences.

In the fourth year, practicum rotations are organized into four different courses. All students must take a course in Laboratory Diagnostics (four weeks) and a course in General Veterinary Practice, involving clinical rotations covering the major domestic species and rural community practice (16 weeks). Students also choose one of four Areas of Emphasis programs (10 weeks) in the following areas: production animal health, equine health, ecosystem and public health, and investigative medicine. Students also follow a course of Clinical Enrichment rotation electives (10 weeks) which cover all major species and areas of veterinary medicine, including small animal, food animal, wildlife and zoo medicine, public practice, international, ecosystem health, and many other electives.

Opportunities

Graduates of the DVM program are eligible for licensure to practice in Canada, but the DVM degree does not itself confer the right to practice. The Alberta Veterinary Medical Association (ABVMA) is the professional organization governing the practice of veterinary medicine in Alberta under the authority of the Veterinary Profession Act. Students interested in exploring matters relative to license to practice in Alberta should refer to the ABVMA website (abvma.ca/). For information relative to license to practice in the other provinces in Canada, students should contact the appropriate provincial veterinary association.

Student Services

The Office of Student Services in the Faculty of Veterinary Medicine serves as the first point of contact for students requiring assistance with any aspect of student life.

Resources

The Faculty of Veterinary Medicine is located on the Foothills Campus and at the Spy Hill Campus, including the Clinical Skills Building, the Veterinary Sciences Research Station, and the Wildlife Research Station. The Foothills campus is located approximately one kilometre south of the main campus of the University of Calgary and functions as home-base for the Faculty, containing faculty and administrative offices, educational space, the Health Sciences Library, a student bookstore, food services, and many of the core research facilities. The Dean's Office is located on the second floor of the Teaching, Research, and Wellness (TRW) building.

The Spy Hill campus is approximately 17 kilometres north-west of the Foothills campus. The Clinical Skills Building (CSB) is the site of clinical and professional skills education during the first three years of the DVM program. The CSB has educational facilities for anatomy, animal handling, medical exercises, surgical exercises, diagnostic imaging, diagnostic support, and pathology instruction. There are outside holding pens for cattle and horses, and kennel facilities for dogs and cats. The CSB also has classrooms, small group teaching rooms, laboratory facilities, and all the necessary support areas. Primary student support services are provided at the Foothills Campus and main campus; however, additional administrative and student support space (e.g. kitchen, lounge area, learning commons) are available at the CSB to support students and activities while they are at that location. The Wildlife Research Station and the Veterinary Sciences Research Station are also located at the Spy Hill campus and support the educational and research activities of the Faculty.

The first three years of the DVM program are delivered predominantly at the Foothills and Spy Hill Campuses, with students spending approximately 50 per cent of their time at each site. Students are responsible for their own travel between sites, with classes scheduled to allow full day activities at each site. During the final year of the DVM program, students complete their practicum rotations on and off campus. Many practicum rotations occur in private veterinary practices and other institutional settings that together constitute the Faculty of Veterinary Medicine's Distributed Veterinary Learning Community. Many of the off-campus sites are located within a 90 minute drive of Calgary, while others are distributed across Alberta and beyond, including international sites. As part of the DVM program, students must participate in learning opportunities at partner sites and may be required to live in close proximity to the site to facilitate on-call responsibilities. While travel support is provided, students are responsible for their travel arrangements to partner locations and for their own accommodation arrangements.

3. Faculty Regulations

3.1 Admissions

The Faculty of Veterinary Medicine accepts 30-32 students per year. Students must be Alberta residents, as defined by the Province of Alberta. The Admissions Committee recommends students for admission to the program on the basis of academic and non-academic factors. Students are assessed academically on performance in their last four full undergraduate terms and in the required courses (see minimum academic standards below). Selected applicants are invited for an interview day where non-academic factors are assessed. At interview day, applicants are required to complete an on-site essay and participate in a series of interviews and other activities. The interview day will normally take place on a week-end in March at the Foothills Campus. Applicants must attend interview day at their own expense. Three references are required. References must include an instructor at a post-secondary institution, a supervisor from a work/volunteer setting and a personal reference who is a non-relative.

Consistent with UCVM's mandate, preference will be given to applicants who demonstrate the attributes for successful careers in veterinary practice that support rural development and sustainability, and for careers related to our areas of emphasis. While no specific animal or veterinary-related experience is required, such experience is an asset. Understanding of the veterinary profession and animal industries relevant to the applicant's career interests is expected. This can be obtained through practical experience or through other means.

The application deadline will normally be in November for admission in the next fall term, with interviews in March in Calgary. The exact dates will be published each fall on our website and included in the application manual. Applicants will typically be notified of the Admissions Committee's decision no later than mid-June.

Applicants to the University of Calgary Faculty of Veterinary Medicine should ensure they have read the Application Manual which can be found on the Faculty website vet.ucalgary.ca/dvmapplication. The applicant manual details the latest requirements, processes and timelines for admissions.

Eligibility

To be eligible for admission, you must be an Alberta resident. The Alberta Government Guidelines within the Student Financial Assistance Regulations will be used to determine residency status. Details of the residency requirements can be found on the Alberta Government website at: studentaid.alberta.ca/before-you-apply/eligibility/.

Proof of Alberta residency will be required with your application. Supporting documents could include: Alberta Health Care card or driver's license. If you have any questions regarding your residency status, please email: vet.admissions@ucalgary.ca.

The Faculty of Veterinary Medicine does not normally accept applications from students who have withdrawn, who have been required to withdraw, or who have been expelled from any school or college of veterinary medicine.

In selecting veterinary medicine students, no consideration shall be given to factors irrelevant to performance such as gender, age, race, or religion. Nor will the vocation of an applicant's parent, guardian, or spouse be a consideration in the selection process.

Physical and learning disabilities must not prevent the applicant, upon graduation, from demonstrating competency in the skills and procedures expected of an individual who has completed a DVM degree in an accredited institution.

Minimum Academic Requirements

Normally, the minimum academic requirements for an applicant to be considered for admission are:

(a) Completion of four or more terms (semesters) of full-time post-secondary undergraduate education at a recognized university or at a college providing university-equivalency in coursework. A full term is defined as a minimum of four courses per term (semester). The fourth term may be in progress at the time of application, but must be completed by April 30th of the year of admission.

(b) A minimum combined average of 3.00 ("B" or its equivalent) over the last four full terms of undergraduate academic years, as defined above. If an applicant has completed four or more terms of full-time undergraduate study at the time of application, the last four terms as of January of the year of admission will be used to calculate your admissions GPA. If applicants are completing their fourth term at the time of application, the GPA will be calculated for the three complete terms for interview eligibility and all four terms for admission.

(c) A minimum overall average of 2.70 ("B-", or its equivalent) with a passing grade in each of the following required courses. Applicants must have completed or be in the process of completing the ten required courses. In-progress courses must be completed by the end of the winter term preceding admission. A required course may not be repeated more than once for consideration. (Grades achieved in a course or its equivalent completed three or more times will not be considered.)

Two Introductory Biology Courses

Two Introductory Chemistry Courses

One Introductory English Course

One Introductory Organic Chemistry Course

One Introductory Statistics Course

One Introductory Biochemistry Course

One Introductory Genetics Course

One Introductory Ecology Course

(d) Courses completed more than 10 years prior to the application date will not normally be considered in the admissions process. Rare exceptions may be made for applicants who have continued to work or study in a health-sciences related field following completion of an undergraduate degree.

Applicants are advised to monitor the UCVM website for any exceptions or changes to these requirements. Students requesting an exception to any aspect of the minimum academic requirements must do so at the time of application by completing the necessary section of the application form. Such requests will only be considered on submission of a complete application.

English Language Proficiency

English language proficiency must be demonstrated for all applicants for whom English is not their first language. English language proficiency can be demonstrated in one of the following ways:

(a) Completion of at least two full years within a degree program offered by an accredited university in a country which the University of Calgary recognizes as English language proficiency exempt.

(b) A minimum score of 92 on the Internet-based TOEFL (Test of English as a Foreign Language) and a minimum score of 50 on the Test of Spoken English (TSE); or a minimum score of 237 on the computer-based TOEFL and a minimum score of 50 on the TSE; or a minimum score of 580 on the paper-based TOEFL and a minimum score of 50 on the TSE.

Applications

Online application forms and the current application manual for the Faculty of Veterinary Medicine are available on the Faculty website vet.ucalgary.ca/dvmapplication. Applicants to the University of Calgary Faculty of Veterinary Medicine should ensure they have read the Application Manual to ensure they are familiar with the latest requirements and processes regarding the admissions process. Please note that application deadlines are strictly followed.

Applications will be considered from those students meeting the residency, English and academic admission requirements. Application packages are to be submitted by the established deadlines along with the application fee. A current set of official transcripts submitted directly to the UCVM Admissions office is required (students should delay submission of the first transcript until final marks from their Fall semester are available; the final submission deadline for transcripts will be established each year but will normally be in the last week of January). Students who have not yet completed four full-time terms or semesters by January of the year of admissions should send their final transcript on completion of the winter term as soon as possible. These transcripts must normally be received by the end of the last week of May, with the final date to be established each year (please consult the current year application manual for details) and must be received prior to final acceptance.

Transcripts should be sent directly to the UCVM Admissions Office:

UCVM Admissions

TRW 2D03, 3280 Hospital Drive NW

Calgary, AB T2N 4Z6

Offers of Admission will be sent by email, typically during the first two weeks of June. You will have five working days to reply either by email (vet.admissions@ucalgary.ca) or telephone (403.220.8699) to this offer. You will have an additional five working days from the date of your email or telephone call to submit (hand delivery, regular mail or courier) the signed acceptance page and deposit of $500.00 to the address above. Failure to do so may result in the position being assigned to another applicant. Such deposits will be applied to the first year's fees. An applicant who accepts a position but later rescinds his or her acceptance will forfeit the entire $500.00 deposit.

Official acceptance letters will be mailed upon receipt of the signed acceptance page and deposit. Letters to waitlisted students and students not offered admission will be sent in the second week of June. If and when additional spaces become available, waitlisted students will be notified immediately. Please note that placements may be available well into the summer.

3.2 Registration

Successful applicants are required to have or receive immunization for tetanus and rabies following admission.

Accuracy of Registration

The Faculty of Veterinary Medicine will directly register successful applicants and ongoing students into all required yearly courses. Payment of fees is the student's responsibility through the Online Student Centre via MyUofC web portal. For more information refer to B.15 Payment of Fees or Notification of Financial Assistance in the Academic Regulations section of this Calendar.

Deferrals

Students wishing to apply for deferral should make this request in a letter to the Dean, care of the UCVM Admissions Office within 15 days of the date at the top of their acceptance letter. Requests for deferred admission will only be considered for applicants who have accepted the offer of admission and paid the $500.00 acceptance fee. The applicant must clearly explain the reason for the deferral request. Deferrals will be considered for academic and/or non-academic reasons, including completion of degrees. Deferral requests for attending other veterinary schools will not be accepted. It is at the sole discretion of the Dean to grant or deny a deferral. Deferrals will normally be for one year only.

Interruption of Program Leading to a Degree

Students who voluntarily withdraw from the DVM program and who wish to return must re-apply to the program through the Admissions Office if they withdrew from first year, or for advanced standing through the Associate Dean (Academic) if they withdrew from second-fourth year. Students contemplating a withdrawal from the program are cautioned that there is an enrolment limitation for the program and that re-entry will be conditional on the availability of space and on academic performance.

3.3 Course Work

Students in the DVM program must take the full complement of required courses in each year of the four year program. There is no provision for students entering the program to take courses on a part-time basis and course credits or exemptions will not normally be provided. Under certain circumstances, incumbent students registered in the program may be permitted to repeat specific courses (and not the entire year), and therefore may enrol in a subset of the program while they repeat those courses.

Policies Relative to Practicum Experiences

Students will be required to complete practicum experiences at sites outside of the city of Calgary in locations throughout the province and further afield. Schedules for student's practicum experiences will also include evenings, nights, and weekends.

Students must demonstrate satisfactory practicum performance as outlined in the objectives of the course. Participation in all activities that are related to practicum courses is mandatory.

A student may be prohibited from attending or completing a practicum experience if there is evidence that the student has acted in a manner that is detrimental to participant safety, patient care or client relations. A student who wishes to appeal such a decision will follow the appeals process as outlined under 3.6 Appeals Process.

3.4 Student Standing

For continuation of study in the DVM program in the Faculty of Veterinary Medicine, a student must satisfy the conditions as presented below.

The regular University grading system will normally apply to all courses in the DVM program. To calculate the grade point average (GPA) for the year under review, grades will be weighted on the basis of course credits. Courses that are given a grade of CR/F will not be included in the calculation of the GPA.

General Requirements

1. To be promoted to the next year of the DVM program, a student must achieve a satisfactory academic standing and clear any failed or incomplete courses. Satisfactory academic standing means having achieved a GPA of 2.00 or higher in the year under review.

2. At the discretion of the Associate Dean (Academic), supplemental privileges may be granted to a student who has received a "D+", "D", or "F" grade in a course. The student must make application to write the supplemental examination to the Associate Dean (Academic) within seven days of the release of grades for the semester within which the "D+", "D", or "F" grade was received.

3. Any student granted a supplemental privilege must meet with the Associate Dean, (Academic) who will inform the student of resources available that might help the student with his or her academic difficulties.

4. A student will be deemed to have failed a course if they attain an "F" grade in the course and they are not eligible for a supplemental privilege, or if they attain an "F" grade in the course and they subsequently fail to attain a grade of "C-" on a supplemental exam.

5. Successful completion of a supplemental exam (a “C-” or above) will not result in a grade higher than "C-" being awarded for the course. If a student who originally received a "D+" or "D" on a course receives a grade lower than a "D", the previously achieved “D” will stand.

6. A student may be granted supplemental privileges only once for a course. Any student who fails a course once, then attains an "F" grade after repeating the same course, will be required to withdraw from the DVM program.

7. No more than two supplemental privileges may be granted to a student in one year of the program, and no more than four supplemental privileges will be granted to a student over the whole program. Any student who attains an "F" grade in a fifth course over the program will be required to withdraw from the DVM program.

8. A student who fails one course may be required to repeat all courses in the year, depending upon the nature and size of the course failed, and a review of the academic performance of the student. A student who fails two courses will be required to repeat the year.

9. Students must normally repeat a failed course, or year, in the academic year immediately following that in which the failure occurred.

10. Normally, students may carry a maximum of one course with a grade of "D" or "D+" in their program. Students who receive a grade of "D" or "D+" in a second course must raise the mark to "C-" through a supplemental exam before being considered for promotion to the next year of the program.

11. Students required to withdraw from the DVM program will not normally be considered for re-admission.

12. Normally, students must complete the requirements of the DVM Program within 6 years of first enrolment. Failure to complete the program within this time will normally result in the student being required to permanently withdraw from the program.

Students Previously in Satisfactory Standing

1. With a GPA of 2.00 or higher for the year under review will retain the standing of satisfactory academic performance.

2. With a GPA of less than 2.00, but not less than 1.70, will be placed on probationary status.

3. With a GPA of less than 1.70 in any year under review will be required to withdraw from the DVM program.

Students on Probation

1. Upon completion of first or second year will have their probation cleared if they attain a GPA of at least 2.00 by the end of second or third year respectively.

2. Upon completion of the third year of the program will not be permitted to proceed to fourth year until they have cleared probation. The Associate Dean (Academic) will establish appropriate remediation requirements that must be fulfilled in order for the students to clear probation and obtain the standing of satisfactory performance. These remediation requirements may include repeating a component of a course, one or more entire courses, or an entire year.

3. Will be required to withdraw from the DVM program if their GPA at the end of the following year is less than 2.00. This is consistent with University regulations, which state that students will be required to withdraw rather than be placed on probation for a second time.

3.5 Graduation

Requirements

Students must have successfully completed all required components of the program.

Students will not be allowed to graduate while on probation or with any failed fourth year courses. The Associate Dean (Academic) will establish appropriate remediation requirements that must be fulfilled in order for students to clear probation and obtain the standing of satisfactory performance. These remediation requirements may include repeating one or more practicum rotations, one or more entire courses, or the entire fourth year.

Degrees "With Distinction"

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of all DVM students with no failures whose grade point average is 3.60 or better across all courses taken during the DVM program.

3.6 Appeals Process

Students may appeal any decision. Students should be familiar with I. Reappraisal of Grades and Non-Disciplinary Academic Appeals in the Academic Regulations section of this Calendar. Appeals at the Faculty level must be submitted in writing to the Associate Dean (Academic) within 15 days of the event or ruling giving rise to the appeal. Any appeal must specify (a) exactly what is being appealed, (b) the grounds for the appeal, and (c) the remedy sought.

3.7 Fees and Expenses

Please refer to the Tuition and General Fees section within the Calendar for details on DVM tuition and general fees. In addition to tuition and general fees, DVM students may be assessed a safety equipment fee.

4. Program Details

4.1 Doctor of Veterinary Medicine

Introduction

The Faculty of Veterinary Medicine of the University of Calgary offers a four-year professional degree leading to a Doctor of Veterinary Medicine (DVM). The first three years of the program follow the regular academic year, while the fourth year is scheduled for 40 weeks, with two additional weeks for assessment, across the entire calendar year (May-April).

The DVM program is accredited by the AVMA-CVMA Council on Education and is based on an integrated core-elective model. The core program provides a comprehensive general veterinary education covering all the major domestic species, including food producing animals, equine and companion animals, and the major exotic animal species. The core program also includes public and ecosystem health, wildlife and conservation medicine, professional and communication skills, research skills and comparative medicine. The core program prepares students for general veterinary practice, with an emphasis on skills for successful practice in rural communities and provides a foundation to pursue all careers in veterinary medicine. The elective programs cover all areas of general veterinary practice and provide enhanced opportunities in four Areas of Emphasis: production animal health, ecosystem and public health, investigative medicine, and equine health.

Admissions

Applicants to the DVM program should refer to the Admissions requirements under 3. Faculty Regulations section. Please consult our website for additional details: vet.ucalgary.ca.

Course Requirements

All courses in the first three years are required, but students have a choice of elective content within some courses. In fourth year, all students are required to take Veterinary Medicine 570 (Laboratory Diagnostics), Veterinary Medicine 580 (General Veterinary Practice) and Veterinary Medicine 590 (Clinical Enrichment).

In fourth year, each student must also choose one of the following elective courses:

Veterinary Medicine 582: Production Animal Health

Veterinary Medicine 583: Ecosystem and Public Health

Veterinary Medicine 584: Equine Health

Veterinary Medicine 585: Investigative Medicine

Regulations

See 3. Faculty Regulations.

Program Sequence

First Year	
Veterinary Medicine 300: Clinical Presentations I	Veterinary Medicine 342: Pathologic Basis of Disease
Veterinary Medicine 305: Clinical Skills I	Veterinary Medicine 343: Immunology
Veterinary Medicine 307: Professional Skills I	Veterinary Medicine 344: Principles of Epidemiology
Veterinary Medicine 320: Anatomy and Histology	Veterinary Medicine 345: Introduction to Nutrition
Veterinary Medicine 321: Physiology	Veterinary Medicine 360: Introduction to Veterinary Medicine
Veterinary Medicine 322: Behaviour	
Veterinary Medicine 323: Animals, Health and Society	
Veterinary Medicine 324: Genetics and Molecular Biology	

Second Year	
Veterinary Medicine 400: Clinical Presentations II	Veterinary Medicine 442: Clinical Pathology
Veterinary Medicine 405: Clinical Skills II	Veterinary Medicine 443: Clinical Pharmacology and Toxicology
Veterinary Medicine 407: Professional Skills II	Veterinary Medicine 444: Diagnostic Imaging
Veterinary Medicine 410: Basic Surgical Principles	
Veterinary Medicine 420: Health Management	Veterinary Medicine 450: Selected Topics in Areas of Emphasis I
Veterinary Medicine 421: Systemic Pathology	Veterinary Medicine 451: Selected Topics in Areas of Emphasis II
Veterinary Medicine 422: Virology	Veterinary Medicine 460: Applied Nutrition
Veterinary Medicine 423: Bacteriology	Veterinary Medicine 461: Outbreak Investigation
Veterinary Medicine 424: Parasitology	Veterinary Medicine 462: Foreign Animal Disease
Veterinary Medicine 440: Public Health and Risk Analysis	Veterinary Medicine 463: Field Experiences in Areas of Emphasis

Third Year	
Veterinary Medicine 500: Clinical Presentations III	Veterinary Medicine 540: Food Animal Medicine and Surgery
Veterinary Medicine 505: Clinical Skills III	Veterinary Medicine 541: Theriogenology
Veterinary Medicine 507: Professional Skills III	Veterinary Medicine 542: Emergency and Critical Care
Veterinary Medicine 520: Advanced Health Management	Veterinary Medicine 550: Selected Topics in Veterinary Medicine III
Veterinary Medicine 521: Equine Medicine and Surgery	Veterinary Medicine 551: Selected Topics in Veterinary Medicine IV
Veterinary Medicine 522: Small Animal Medicine and Surgery	Veterinary Medicine 561: Ecosystem and Public Health Field Course
Veterinary Medicine 523: Anesthesiology and Therapeutics	Veterinary Medicine 531: Selected Topics in Veterinary Medicine II
Veterinary Medicine 530: Selected Topics in Veterinary Medicine I	

Fourth Year
Students take four courses in fourth year. The year is scheduled over a total of 40 weeks across an entire year with an additional two weeks for assessment, commencing immediately after completion of third year (May-April). All four courses are comprised of practicum rotations that are also scheduled across the entire calendar year.
Veterinary Medicine 570: Laboratory Diagnostics
Veterinary Medicine 580: General Veterinary Practice
Veterinary Medicine 590: Clinical Enrichment
One of the following elective courses:
Veterinary Medicine 582: Production Animal Health
Veterinary Medicine 583: Ecosystem and Public health
Veterinary Medicine 584: Equine Health
Veterinary Medicine 585: Investigative Medicine

5. Administration

Faculty Administrative Officers

Dean

TBD

Associate Deans

E.K. Read, Academic

T. Schiller, Clinical Programs

J.R. Matyas, Graduate Education

J.S. Gilleard, Research

Assistant Dean

M. Read, Admissions and Recruitment

Werklund School of Education

Degrees Offered

Undergraduate Degrees		
Four-Year (Community-Based)	BEd	
Two-Year (Consecutive)	BEd	
Five-Year (Concurrent)		
Co-operating Faculties for Five-Year (Concurrent)		Major
Arts/Education	BA/BEd BFA/BEd BMUS/ BEd BSc/BEd	Canadian Studies/Education Communication and Culture (Multidisciplinary)/Education Developmental Studies/ Education Drama/Education English/Education French/Education Geography/Education History/Education International Relations/ Education Music/Education Political Science/Education Sociology/Education Second Languages/ Education Visual Studies/Education
Kinesiology/ Education	BKIN/BEd	Kinesiology (Leadership in Pedagogy and Coaching)/ Education
Science/Education	BSc/BEd	General Mathematics/ Education Natural Sciences/Education

Graduate
MA MSc MEd MC PhD EdD

Four-Year BEd (Community-Based)
Teachable Subject Area
Language Arts Mathematics Science Social Studies

Five-Year BEd (Concurrent)	
Elementary	**Secondary**
Early Childhood Education English as an Additional Language English Language Arts Fine Arts – Music Fine Arts – Drama Fine Arts – Visual Arts French Inclusive Education Mathematics Physical Education Second Languages Science Social Studies	English Language Arts Fine Arts – Music Fine Arts – Drama Fine Arts – Visual Arts French Mathematics Physical Education Second Languages Science - Biology Science - Chemistry Science - Physics Social Studies

Two-Year BEd (Consecutive)	
Elementary	**Secondary**
Early Childhood Education English as an Additional Language English Language Arts Fine Arts – Music Fine Arts – Drama Fine Arts – Visual Arts French Inclusive Education Mathematics Physical Education Second Languages Science Social Studies	English Language Arts Fine Arts – Music Fine Arts – Drama Fine Arts – Visual Arts French Mathematics Physical Education Second Languages Science – Biology Science – Chemistry Science – Physics Social Studies

1. Summary of Degree Programs

The Werklund School of Education offers three undergraduate degree options:

- Four-Year BEd (Community-Based) program
- Five-Year BEd (Concurrent) program
- Two-Year BEd (Consecutive) program for holders of approved degrees

All students in the Five-Year BEd (Concurrent) and Two-Year BEd (Consecutive) programs must choose a route - elementary route (kindergarten through grade 6) or secondary route (grades 7 through 12) and a Teachable Subject Area. Students in the Four-Year BEd (Community-Based) program will be asked to choose ONLY a Teachable Subject Area.

PLEASE NOTE: All Bachelor of Education Degree programs are offered on a full-time basis only. Part-time studies are not permitted without the express permission of the Associate Dean.

Graduate Programs in Education

Information on graduate work leading to Master of Education (MEd), Master of Counselling (MC), Master of Arts (MA), Master of Science (MSc), Doctor of Philosophy (PhD) and Doctor of Education (EdD) degrees appear in the Graduate Studies Calendar.

For more information and advice regarding Graduate Programs offered by the Werklund School of Education please contact the Graduate Programs in Education (GPE) Office.

Location: Education Tower 114

Telephone: 403.220.5675

Fax: 403.282.3005

Email address: gpe@ucalgary.ca

Website: werklund.ucalgary.ca/gpe/

2. Faculty Regulations

Students in the Werklund School of Education are governed by the academic regulations contained within the individual program sections and also the Undergraduate Admissions and Academic Regulations sections of the Calendar. Students are advised to read and consider all regulations and if there are any questions, they should consult the student advisors in the relevant faculties.

Table of Contents

2.1 Advising and Program Information

Undergraduate Programs in Education Office

Undergraduate Programs in Education (UPE) is the home of undergraduate programs in the Werklund School of Education. In addition to housing the Associate Dean, the Directors of Student Experience and Directors of Field Experience, UPE connects students with any academic assistance they require.

Services include:

- Program advising for prospective and current students
- Field Experience advising
- Career advising
- Graduation checks and confirmation
- Changes of Program
- Leaves of Absence requests
- Letters of Permission for study at other institutions
- Degree Navigator assistance
- Diverse Qualifications applications and admissions
- New student registration

Location: Education Tower 230

Phone: 403.220.5639

Email: upe@ucalgary.ca

Website: werklund.ucalgary.ca/upe

Student Advisors

Student advisors in UPE assist undergraduate students in the Five-Year BEd (Concurrent), Two-Year BEd (Consecutive), and Four-Year BEd (Community-Based) degree programs in planning their overall degree programs. For example, they provide advice and information for students on:

- Contextual (big-picture) questions about the Bachelor of Education Program
- Graduation checks and confirmation
- Changes of Program
- Letters of Permission for study at other institutions
- Degree Navigator assistance
- Program admission evaluation
- Admissions for special populations
- Student registration

Field Experience Advisors

Field Experience advisors in UPE assist undergraduate students in planning their Field Experiences as part of the BEd. For example, they provide advice and information for students on:

- Field Experience placements
- Field Experience course registration
- Field Experience advising

Career Advisor

The Career Advisor in UPE supports undergraduate students in achieving their overall career goals and developing strategies for success in entering the profession of teaching. For example, they provide advice and information for students on:

- Career Planning
- Job Search Support
- Resume Reviews
- Career Workshops
- Online Job Postings
- Career Fairs
- Networking Events
- Information Sessions

Director, Student Experience

The Director, Student Experience in UPE supports undergraduate students in the BEd Concurrent and Consecutive programs who may require additional support and accommodation in order to enhance the students' academic and overall student experience.

Director, Student Experience (Community-Based)

The Director, Student Experience (Community-Based) in UPE supports undergraduate students in the Four-Year BEd (Community-Based) program who may require additional support and accommodation in order to enhance the students' academic and overall student experience.

Director, Field Experience

The Director, Field Experience in UPE provides leadership in the ongoing development of the BEd field experience curriculum, student assessment and assists with counseling students on matters regarding field experience.

Director, Field Experience (Community-Based)

The Director, Field Experience (Community-Based) in UPE provides leadership in the ongoing development of the BEd field experience curriculum, student assessment and assists with counseling students on matters regarding field experience as it relates to the Four-Year BEd (Community-Based) program.

Other Advising Offices

Students in the BEd Concurrent program must also consult with an advisor from their co-operating faculty. Undergraduate Advising Offices are found in Arts, Science and Kinesiology.

Arts Students' Centre

Location: Social Sciences 102

Phone: 403.220.3580

Email: artsads@ucalgary.ca

Website: ucalgary.ca/undergraduate/

Undergraduate Science Centre

Location: Energy Environment & Experiential Learning (EEEL) 445

Phone: 403.220.8600

Email: usc@ucalgary.ca

Website: ucalgary.ca/science/undergraduate/usc

Faculty of Kinesiology Advising Office

Location: Kinesiology B 145

Phone: 403.220.7018 or 403.220.3407

Email: knesinfo@ucalgary.ca

Website: ucalgary.ca/knes/undergraduate

Student Success Centre

The Student Success Centre (SSC) provides broad educational planning, learning support, assistance with academic difficulties, academic program guidance, writing support, success seminars, and peer support.

Location: Taylor Family Digital Library, 3rd Floor

Phone: 403.220.5881

Email: success@ucalgary.ca

Website: ucalgary.ca/ssc/

Enrolment Services

Enrolment Services helps with registration issues and problems, fee payments, awards, financial aid, admissions questions, visiting and exchange students, open studies, transcripts, deferred exams, etc.

Location: MacKimmie Block (MB) Lobby

Phone: 403.210.7625

Website: ucalgary.ca/currentstudents/contact

2.2 Objectives

The teaching profession requires that teachers have a solid background in one or more academic disciplines and a demonstrable mastery of the knowledge and skills associated with effective teaching. Programs in the Werklund School of Education recognize these demands and promote inquiry and life-long professional growth, as well as university-school and community collaboration that will integrate theory with practice.

Program graduates are eligible to apply for Alberta provincial teaching certification from kindergarten to grade 12.

2.3 Career Opportunities

Eligibility to Teach in Alberta

Alberta provincial teaching certification is a two-stage process and it requires separate evaluations by separate governing bodies.

- Alberta Education issues teaching certificates.
- The Alberta Teachers' Association (ATA), through the Teacher Qualifications Service (TQS), determines salary.

Both evaluations are required to be eligible to teach in Alberta public schools.

Certification

To be eligible to teach in Alberta, a valid teaching certificate issued by the Province of Alberta is required. After the successful completion of the BEd program, a student may be recommended for an Alberta Interim Professional Certificate by the Werklund School of Education. Typically all of the required units needed for certification are included within the courses taken as a part of the BEd program.

Note: In order to meet certification requirements students who are in the Two-Year Consecutive BEd program are required to present 3 units in English/French Literature in addition to the courses taken as a part of the BEd. Typically, this is taken as a part of the student's first degree, or it can be taken following the completion of the first degree as long as it is completed prior to admission to the BEd program.

Teachers Certified in Other Jurisdictions

Teachers who have been certified to teach in other jurisdictions (other provinces and other countries) and who wish to teach in Alberta must contact Alberta Education, Teacher Development and Certification Branch to have their credentials evaluated.

Certification Enquiries

All enquiries concerning certification should be directed to Alberta Education:

Email: teacher.certification@gov.ab.ca

Phone: 780.427.2045 (for toll-free access anywhere in Alberta, first dial 310.0000)

Website: education.gov.ab.ca/k_12/teaching/Certification/

Teacher Qualifications for Salary Purposes

Evaluations for salary purposes are determined by the Teacher Qualification Service (TQS), Alberta Teachers' Association, and not by Alberta Education or the University of Calgary.

For more information, please contact the Teacher Qualifications Service at teachers.ab.ca/For%20Members/Salary%20Benefits%20and%20Pension/TeacherQualificationsService/Pages/Index.

Teacher Qualifications Service

The Alberta Teachers' Association

Barnett House, 11010 - 142 Street NW

Edmonton, Alberta

Canada T5N 2R1

Careers in Education

The majority of teacher education graduates can expect to work as kindergarten/elementary and/or secondary teachers. Indeed, the role of classroom teacher is one that permits graduates to work most closely with young people and allows for the greatest direct service to educational communities. The modern context of education demands that graduates be prepared to go beyond the traditional role of classroom teacher. To teach successfully, graduates must be prepared to work closely and effectively with students, colleagues, parents, and the community in virtually every aspect of educational decision-making. Furthermore, graduates must understand and embrace that it is imperative to extend their formal education throughout their careers. The successful completion of a BEd program is only the beginning of a teacher's academic and professional learning.

Increasingly, education students are finding employment in community and workplace settings. Teachers develop numerous skills that are highly valued in community, government, and business organizations.

Many graduates will choose from one or more additional careers in education, nearly all of which require successful experience as a school-based practitioner, permanent professional certification, and a master's or doctoral degree in education:

- Curriculum developer
- Assessment designer
- Administrator
- Staff developer
- Staff officer for a teachers' professional association
- Author of instructional resources
- College instructor
- University professor

2.4 Police Information Check

All applicants to the Werklund School of Education are required to provide, to partner school administration, a current Police Information Check which includes a Criminal Record Check and a Vulnerable Sector Search. Students who are not residents of Calgary, must arrange for a Police Information Check, including a Vulnerable Sector Check, through the nearest local police service or RCMP detachment in the area where they reside.

Failure to present a current Police Information Check clear of any previous or pending charges and convictions will result in the student being unable to do their Field Experience courses. As Field Experience is a critical component of the program, without which students cannot complete the BEd program, students who are unable to present a current and clear Police Information Check will be required to withdraw from the BEd program at the sole discretion of the Werklund School of Education and the University of Calgary.

Students who are concerned about the presence of a criminal record should contact the police department to discuss the process for eliminating or erasing such a record.

In order to be considered "current", the Police Information Check must be completed after June 1st and students will be required to request a new Police Information Check every 12 months. The original Police Information Check must be present, in person, to partner school administration on the first day of Field Experience (Education 440, 465, 540, 560); the school may wish to keep a copy but the student should retain the original.

2.5 Student Affairs

Education Students' Association

The Education Students' Association (ESA) is a professional organization and a student local of the Alberta Teachers' Association (ATA). Through its relationship with the Werklund School of Education, it provides an important liaison between students and the profession. It is expected that all Education students will join the society, actively promote its professional interests, and participate in its social activities.

For more information, please visit the ESA website: ucalgary.ca/esa/.

3. Werklund School of Education Regulations

3.1 Admission

New applicants should refer to A.2 in the Undergraduate Admissions section of this Calendar for regulations regarding University admission requirements.

Application Deadlines

Please refer to the prospective students' link at: ucalgary.ca/prospectivestudents/.

Students are advised to check this website for the most up-to-date information.

Diverse Qualifications

Applicants who have achieved significant accomplishments outside the university, and/or overcome severe hardships that qualify them for entry into this program are encouraged to apply under the Diverse Qualifications Admission Policy. For additional information regarding the diverse qualifications admission policy and application deadlines, please refer to ucalgary.ca/admissions/process/diverse.

International Applicants

In addition to the admission requirements of the Werklund School of Education, applicants from other countries, whose first language is not English, must fulfill the English Language Proficiency requirements outlined in the Undergraduate Admissions section of this Calendar.

3.1.1 Four-Year BEd (Community-Based) Program

Students wishing to enter the Four-Year Bachelor of Education (Community-Based) degree program must meet minimum admission requirements as set out in the Undergraduate Admissions section of this Calendar. This program begins in the Summer Term and has only one intake per year.

Transfer to the Four-Year BEd (Community-Based) Program

1. Students transferring from other faculties and institutions must meet the deadlines and competitive admission requirements in place for the program to which they are applying. For more information refer to A.2 in the Undergraduate Admissions section of this Calendar.

2. Students who have received one or more approved undergraduate degrees (BA, BSc, etc.) may apply for admission to the Two-Year BEd (Consecutive) Program. Degree holders are not eligible for admission to the Four-Year BEd (Community-Based) Program. For more information regarding admission to a second undergraduate degree, refer to A.5.5 in Undergraduate Admissions.

3. To qualify for a degree, a transfer student must successfully complete all required Education (EDUC) courses (60 units or 10.0 full-course equivalents) while registered in the Werklund School of Education. Students can transfer no more than half of the courses (60 units or 10.0 full-course equivalents) into the Four-Year BEd (Community-Based) Program.

3.1.2 Five-Year BEd (Concurrent) Program

High school course requirements for admission to the Five-Year BEd (Concurrent) program are found in the Faculty of Arts, Science or Kinesiology admission sections. The Werklund School of Education does not have additional course requirements. Enrolment in the Werklund School of Education is limited and students will be admitted on a competitive basis. Meeting the minimum requirements for the Faculty of Arts, Science, Kinesiology does not guarantee admission to the Werklund School of Education.

Transfer to the Five-Year BEd (Concurrent) Program

Students who wish to transfer to the Five-Year BEd (Concurrent) program should not have completed more than 60 units (10.0 full-course equivalents) in transferable courses at the post-secondary level by the end of the Winter Term and must have a GPA of at least 2.50 based on their last 30 units (5.0 full-course equivalents).

It is required that all concurrent students complete Education 201 prior to entering the third year of the Five-Year BEd (Concurrent) program. Students who have not completed Education 201 cannot progress to Semester 1 of the BEd program.

3.1.3 Two-Year BEd (Consecutive) Program

To be considered for admission, applicants must present the following requirements:

1. a degree with at least 90 units (15.0 full-course equivalents) from an accredited post-secondary institution recognized by the University of Calgary, and

2. a minimum grade point average (GPA) of 2.50.

Admission to the program is on a competitive basis by Teachable Subject Area; therefore, meeting the minimum requirements does not guarantee admission.

The GPA is calculated using the grades from the most recent course work to a maximum of 30 units (5.0 full-course equivalents). University of Calgary courses and/or transferable courses taken at other institutions will be considered. All grades within a term will be included, except where the number of courses taken within a term exceeds 30 units (5.0 full-course equivalents), in which case the highest grades will be used.

For students currently completing a degree, Winter and Summer Term (including Spring Intersession) grades will not count toward admission GPA for the following Fall Term. However, admission is conditional subject to successful completion of the current degree, prior to commencement of the BEd (Consecutive) program.

Course Requirements for Admission to the Two-Year BEd (Consecutive) Program

Elementary Route

Applicants interested in focusing on elementary education require an academic degree from a recognized university, with an academic area normally from the humanities, social sciences, natural sciences, fine arts, cultural studies, or communication.

The elementary route (kindergarten to grade 6) of the BEd prepares graduates to teach across the elementary grades and in a Teachable Subject Area.

To be eligible for admission, all applicants must complete 3 units (0.5 full-course equivalent) in English literature or French literature, prior to entering the program.

Applicants in the Elementary-French Teachable Subject Area must be proficient in French and will be required to demonstrate their proficiency prior to admission to the program.

Secondary Route

Applicants must present an undergraduate degree with an academic major or a minimum of 30 units (5.0 full-course equivalents), of which only 12 units (2.0 full-course equivalents) can be at the first year level, in the Teachable Subject Area the applicant chooses, except for Fine Arts, French, and Second Languages, where a degree in the Teachable Subject Area is required.

To be eligible for admission, all applicants must complete 3 units (0.5 full-course equivalent) in English literature or French literature, prior to entering the program.

To be eligible for the following Teachable Subject Areas, applicants are required to meet the degree requirements listed below:

Art Education (Fine Arts)

Applicants must present a degree with a major in art.

Drama Education (Fine Arts)

Applicants must present a degree with a major in drama.

English Language Arts

Applicants must present a degree with a major in English. Applicants who do not have a degree with a major in English must present a minimum of 30 units (5.0 full-course equivalents) in a range of areas that may include: historical surveys of English literature; critical reading and writing; Canadian literature; popular genres of literature; children's literature; and, world literature.

French

Applicants must present a degree taught in French in one or more of the following areas: French literature, science, mathematics, history, or the equivalent. If the degree was not taught in French, applicants must have a major in French. Applicants must be fully competent in oral and written French and demonstrate this competency prior to admission to the program.

Mathematics

Applicants must present a degree with a major in mathematics, or a degree with a minimum of 30 units (5.0 full-course equivalents) that demonstrate proficiency in at least five of the following areas: calculus, number systems, number theory, linear algebra, geometry, probability, statistics, applied mathematics, discrete mathematics, or history of mathematics.

Music (Fine Arts)

Applicants must present a degree with a major in music. Secondary music teachers need to be proficient on an instrument, have a coherent understanding of music theory and history, sophisticated conducting and aural skills in a choral/instrumental environment, plus a working knowledge of appropriate repertoire and musical concepts. Applicants should be prepared to instruct in a beginner band/choral environment.

Physical Education

Applicants must present a degree from a CCUPEKA PE accredited undergraduate program and/or graduate from a KNES/PE undergraduate program. Applicants who do not have a degree with a major in kinesiology, or a degree that is not from an accredited program, must present a minimum of 30 units (5.0 full-course equivalents), in a range of the following areas that include: anatomy, human physiology, exercise physiology, biomechanics, motor learning/control, sport or health psychology, growth and development, health education, physical education for special populations, and activity-based courses. Students should have prior experience and be prepared to instruct activity-based courses in a Physical Education environment.

Second Languages

Applicants must present a degree taught in a second language. If the degree was not taught in a second language, applicants must have a major in a second language. The major must include a minimum of 30 units (5.0 full-course equivalents), in one or more of the following areas: literature, history, or the equivalent.

Biology (Science)

Applicants must present a degree with a major in biology. Applicants who do not have a degree with a major in biology must present a minimum of 30 units (5.0 full-course equivalents) that demonstrate proficiency in five of the following areas: biochemistry, botany, cellular microbiology, molecular microbiology, ecology, evolutionary theory, genetics, human anatomy, physiology, and zoology. Other areas of knowledge which are important for secondary biology teachers include biological conservation, genetic engineering, and immunology.

Chemistry (Science)

Applicants must present a degree with a major in chemistry. Applicants who do not have a degree with a major in chemistry must present a minimum of 30 units (5.0 full-course equivalents) in five of the following areas: inorganic, organic, physical, analytical chemistry, biochemistry, quantum mechanics, and thermodynamics. Other areas of knowledge which are important for secondary chemistry teachers include electrochemistry, industrial chemistry, and spectroscopy.

Physics (Science)

Applicants must present a degree with a major in physics. Applicants who do not have a degree with a major in physics must present a minimum 30 units (5.0 full-course equivalents) that demonstrate proficiency in five of the following areas: classical mechanics, electromagnetism, modern physics, optics, quantum mechanics, statistical mechanics, relativity theory, and thermodynamics. Other areas of knowledge which are important for secondary physics teachers include acoustics, atmospheric physics, biophysics, and environmental physics.

Social Studies

Applicants must have completed a minimum of 30 units (5.0 full-course equivalents) across the following three areas with at least 3 units (0.5 full-course equivalent) per area:

1. **History**
   Applicants must present course work in Canadian history, European history, or world history. Courses with a major focus on history, although not designated as history courses, may be considered as suitable background. In these cases, a course outline must be submitted for review.
2. **Geography**
   Applicants must present course work in physical geography, human geography, or other courses with a focus on human interaction with physical and cultural environments.
3. **Social Sciences**
   Applicants must present course work in the social sciences. Suitable courses may include: political science, sociology, economics, anthropology, and archaeology, cultural studies, women's studies, native studies, religious studies, Canadian studies, globalization,

indigenous studies, international relations, philosophy and psychology.

3.2 Registration and Courses

3.2.1 Accuracy of Registration

Students are responsible for the completeness and accuracy of their registration and for arranging their course selections to meet all degree and program requirements as detailed in this Calendar. Any departure from standard degree and program requirements specified in this Calendar must receive prior written authorization by the Associate Dean, Undergraduate Programs or other designate of the Dean.

Registration at all times should be appropriate to a student's current degree program unless a student receives explicit permission from the Associate Dean, Undergraduate Programs. Students with inappropriate course selections may require extra courses and additional time to complete their degrees.

3.2.2 Registration Planning and Consultation

It is important for all students to check their records and registration regularly with the online Program-monitoring system, Degree Navigator, and meet with the relevant program advisors for guidance on any questions. Students should acquaint themselves with the dates and deadlines for registration set by the University (see B. Registration in the Academic Regulations section of this Calendar) and allow sufficient time before these deadlines to plan their registration and consult with advisors.

As students approach the completion of their programs, it is strongly recommended that students meet with a student advisor for a graduation check. Otherwise, a complete program audit is not done until a student applies for graduation when the consequences of any problems can be very serious.

Students who are experiencing difficulty in registration should consult with a BEd student advisor in the Werklund School of Education. Students should ensure that they comply with the dates and deadlines for registration set by the University (see B. Registration in the Academic Regulations section of this Calendar) and allow sufficient time before these deadlines to plan their registration and consult with the student advisors.

3.2.3 Residency

Students in the Four-Year BEd (Community-Based) program are expected to attend face-to-face on-campus instruction during two intensive weeks during the Summer Term and then will continue with an online component for the remainder of the term.

Students in the Five-Year BEd (Concurrent) and Two-Year BEd (Consecutive) take courses predominantly on-campus.

3.2.4 Course Load

The BEd program is a full-time program. Only students admitted to the BEd will be permitted to register in Education (EDUC) courses. Students must complete all of the required courses in the term and sequence as they are prescribed. Students cannot be enrolled in any other program, either graduate or undergraduate, at the same time as the BEd, unless in an approved Concurrent program.

Additional Courses Outside of Werklund School of Education

Since the BEd program is a full-time professional program, students are not allowed to take more than 15 units (2.5 full-course equivalents) per each Fall or Winter Term without the express permission of the Associate Dean. This includes courses outside the Werklund School of Education.

Courses From Other Institutions

All Education (EDUC) courses must be taken through the Werklund School of Education.

Students in the Four-Year BEd (Community-Based) program may choose to take additional coursework at another institution to use towards their required non-education courses. Students may apply online for authorization by requesting a Letter of Permission through their online Student Centre. Students should check with student advisors in the Werklund School of Education to ensure that the courses taken would meet requirements prior to enrolling.

Students in the Five-Year BEd (Concurrent) program should consult with their co-operating Faculty if they are interested in taking courses from another institution to be used towards their non-education degree requirements.

Students in the Two-Year BEd (Consecutive) program may choose to take additional coursework at another institution to meet certification requirements prior to admission to the program. The GPA calculation for certification purposes are based only on Education (EDUC) courses.

After a request for a Letter of Permission is approved, an appropriate letter will be sent to the Registrar of the other university. The Letter of Permission must be obtained before the student registers for the courses at the other institution.

It will be the responsibility of the student to ensure that an official transcript of grades is forwarded directly to the Registrar of the University of Calgary in order that appropriate credit may be officially recorded.

Students with poor academic performance, including those on probation or having a large number of withdrawals, will not be allowed to take courses at another institution.

3.2.5 Withdrawal from Courses

Withdrawal from one or more courses or from all courses in a semester can have serious consequences. Students are referred to B.14 Withdrawal from Courses and Withdrawal from the Term in the Academic Regulations section of this Calendar.

Before withdrawing from courses, students are required to seek approval from the Director, Student Experience OR the Director, Student Experience (Community-Based) based on the student's BEd program, prior to the deadline date for withdrawal. Students are also encouraged to meet with a student advisor for guidance prior to requesting approval for a withdrawal.

Students may not withdraw from a Field Experience course once it has commenced (Education 440, 465, 540, 560), except with permission. A student may be required to withdraw from the Field Experience if the school deems it appropriate.

Students will be required to withdraw from the BEd program if they have withdrawn from more than 15 units (2.5 full-course equivalents) of Education (EDUC) courses. Students who are required to withdraw will be advised in writing.

3.2.6 Repetition of Courses

A student may repeat a course previously attempted (excluding withdrawals) only once. Permission from the Associate Dean is required to repeat a course more than once, and is granted only under exceptional circumstances.

Students repeating courses taken at the University of Calgary will not have the original grade, failure or otherwise, removed from the transcript of record. The transcript of record will indicate both the original grade and the repeated course with its final grade in the semester in which it was taken.

3.2.7 Deferral of Term Work

Students who do not successfully complete coursework or field experience due to extenuating circumstances must provide written evidence and seek the approval of the Associate Dean for a deferral of term work. However, additional field experience placements are not always available and therefore, permission to defer term work may be denied.

3.2.8 Leave of Absence

Students are allowed to request a leave of absence for a period of up to one year after successful completion of one term in the BEd program. Only one leave of absence will be granted for the duration of the BEd program. Students will be notified in writing if they are approved for a Leave of Absence.

Students who wish to take a leave of absence must make a formal request in writing to the Director of Student Experience. Students returning to the program after a leave of absence must notify the Werklund School of Education by March 1st if they are planning to return for the Fall Term and by October 1st if they are planning to return for the Winter Term. Students who do not return to the program after their leave of absence will be required to re-apply for admission. Due to the prescribed nature of the BEd programs, students returning from a year-long Leave of Absence must register no later than the next available term in which their required courses are offered.

3.2.9 Duration of Study

Four-Year BEd (Community-Based) degree program:

Students must complete the Four-Year BEd (Community-Based) degree program within seven years from initial registration.

Five-Year BEd (Concurrent) degree program:

Students must complete the Five-Year BEd (Concurrent) program within seven years from initial registration.

Two-Year BEd (Consecutive) degree program:

Students must complete the Two-Year BEd (Consecutive) degree program within five years from initial registration.

Students may not interrupt their degree program in the Werklund School of Education unless they are on an approved Leave of Absence.

3.3 Student Standing and Academic Review

Students in the Four-Year BEd (Community-Based) degree program will have their academic standing reviewed after each Fall and Winter Term. All courses taken since the previous academic review will be used and this includes courses taken at the University of Calgary as well as those taken at other institutions on an approved Letter of Permission.

Students in the Five-Year BEd (Concurrent) degree program will have their academic standing reviewed using completed courses in their co-degree after the Winter Term in years 2 and 4 to determine if they are eligible to progress to their education coursework in the subsequent Fall Term. They will also have their academic standing reviewed after each Fall and Winter Term in years 3 and 5, while in their Education coursework.

Students in the Two-Year BEd (Consecutive) degree program will have their academic standing reviewed after each Fall and Winter Term.

All students' academic standing will be reviewed using courses which have been completed since the previous review.

A student's academic standing may be reviewed at any time at the discretion of the Associate Dean.

Satisfactory Academic Standing

Students who have successfully completed all courses with a minimum GPA of 2.50, calculated based on all courses taken since the student's last academic review, are in satisfactory academic standing.

Unsatisfactory Academic Standing

Students are referred to section F.7 Unsatisfactory Standing in the Academic Regulations section of this Calendar for more information.

Students who have achieved a GPA of less than 2.50, calculated based on all courses taken since the student's last academic review, are considered to have an unsatisfactory academic standing in the Werklund School of Education and may be:

- Placed on academic probation, or
- Required to withdraw from the program

Academic Probation

- A student who has achieved a GPA of at least 2.00 but less than 2.50, calculated based on all courses taken since the student's last academic review, will be placed on academic probation until their next academic review.
- A student who has failed a course in the BEd program, will be placed on academic probation for one year.
- Students placed on academic probation will be advised in writing.

Required Withdrawals

- A student who has achieved a GPA of less than 2.00, calculated based on all courses taken since the student's last academic review, will automatically be required to withdraw from the BEd program.
- A student who is on academic probation and has achieved a GPA of less than 2.50, calculated based on all courses taken since the student's last academic review, will be required to withdraw from the BEd program.
- Students will be required to withdraw from the BEd program if they have withdrawn from more than 15 units (2.5 full-course equivalents) Education (EDUC) courses in the BEd program.
- If a student who is on probation receives a second failing grade, they will be required to withdraw from the BEd program.
- Students required to withdraw will be advised in writing.

Reinstatement to Satisfactory Academic Standing

Students on academic probation who have achieved a GPA of 2.50 or higher, calculated based on all courses taken since the student's last academic review, will be reinstated to satisfactory academic standing.

Students who have successfully completed the course in which they received a failing grade, will be reinstated to satisfactory academic standing and may proceed to the next term.

Readmission After Unsatisfactory Academic Performance

Students re-admitted after having been required to withdraw from the Werklund School of Education due to unsatisfactory academic performance must maintain a grade point average of at least 2.50 on all courses taken in each semester after re-admission. Failure to do so will result in permanent withdrawal from the Werklund School of Education.

Students who are required to withdraw may not apply for re-admission in the twelve month period following their required withdrawal. In addition to the online admission application, students must write a letter to the Associate Dean requesting re-admission to the program.

Students who have been required to withdraw from the Werklund School of Education, other Faculties at the University of Calgary or other post-secondary institutions due to unsatisfactory academic performance or excessive course withdrawals may be considered for re-admission after 12 or more months have elapsed since they were required to withdraw.

Re-admission is not guaranteed. Applicants must apply by the deadlines stated in the current Calendar, meet the current admission requirements of the BEd program and obtain express permission from the Director, Student Experience or Associate Dean, Undergraduate Programs in Education before they can return to the program.

Mitigating Circumstances

Students who would normally be required to withdraw on the basis of their academic performance or excessive withdrawals may instead be placed on academic probation, if they have experienced serious mitigating circumstances and can demonstrate that they have good prospects for future success. Students who believe that they fall into this category should provide written documentation to the Associate Dean, Undergraduate Programs as soon as possible and no later than the end of the term.

Voluntary Withdrawal from Program

Students must notify Undergraduate Programs in Education in writing of their intention to withdraw. After a voluntary withdrawal from the program, students will be required to re-apply for admission.

3.3.1 Progression

Normally students in the BEd program will take their required courses in the prescribed sequence. Students should successfully complete all of 400-level Education (EDUC) courses prior to proceeding to the subsequent 500 level courses.

Students in the second and fourth years of the Five-Year BEd (Concurrent) program will normally be allowed to proceed into the third or fifth years of the program provided they have achieved a minimum GPA of 2.50, calculated on all courses taken since the student's last academic review. Additionally students in the second year of the concurrent program should have completed 60 units (10.0 full-course equivalents) prior to starting year three.

4. BEd Program Details

The Bachelor of Education program recognizes that teaching is one of the most important and challenging professions in society; therefore, a teacher should be knowledgeable, thoughtful, and deeply caring about the responsibilities associated with education.

The BEd program focuses on teachers as experts of learning in Teachable Subject Areas for the elementary, secondary and K-12 routes, field experiences linked to partner research schools, and integration across program components (courses). The Bachelor of Education program will:

- Foster professional competencies that are appropriate to a complex and rapidly changing world;

- Have an applied and critical knowledge of theories of learning and learners;
- Develop the specialized knowledge associated with teaching a discipline, and in fostering an interdisciplinary approach;
- Critically evaluate and respond to the contexts of contemporary learning in relation to changing sociocultural, political, economic, environmental, and technical realities within the broader public sphere;
- Foster a critical and pragmatic knowledge of diversity in education;
- Contribute actively to knowledge in the field of education;
- Understand the legal, moral, and ethical frameworks of contemporary education;
- Respond to the diverse needs of students;
- Build research capacity as teacher professionals.

The program is delivered through plenaries, seminars, and field experiences.

4.1 Course Requirements Common to All Programs

The following courses are required for all Bachelor of Education students in the Werklund School of Education.

Education 420 Issues in Learning and Teaching

Education 427 Science, Technology, English and Mathematics (STEM)

Education 430 Pragmatics of Learning and Teaching

Education 435 Literacy, Language and Culture

Education 445 Individual Learning: Theories and Applications

Education 450 Diversity in Learning

Education 456 Assessment

Education 460 Specialization I

Education 520 Interdisciplinary Learning

Education 525 Ethics and Law in Education

Education 530 FNMI History, Education and Leadership

Education 535 Specialization II

Education 545 Curriculum I - Sciences, Kinesiology

Education 550 Curriculum II - Arts and Humanities

Education 556 Professional Development and Lifelong Learning

The following Field Experience courses must be completed successfully with a grade of "CR" (Completed Requirements):

Education 440 Field Experience I

Education 465 Field Experience II

Education 540 Field Experience III

Education 560 Field Experience IV

4.2 Four-Year BEd (Community-Based) Program

The Four-Year BEd (Community-Based) program provides opportunities for students to remain in or near their rural and remote communities for the majority of their degree program. Offering 1-2 courses on-campus each summer provides students with the opportunity to work with their cohort in a face-to-face environment, attend orientation and social events and to connect with the Werklund School of Education and the University of Calgary. Our experience with blended programs indicates that including on-campus courses and experiences each academic year, provides for a stronger pedagogical program, significantly increases the retention rate and reduces the number of courses to be taken throughout the Fall and Winter Terms. It further creates a strong relational bond among students within their particular cohort during their campus experience that extends when they return to their communities.

The Four-Year BEd (Community-Based) program consists of 120 units (20.0 full-course equivalents) to be distributed according to the following list:

57 units (9.5 full-course equivalents) in Education courses including:

Education 201 (to be taken in Year 1)

Education 420, 427, 430, 435, 440, 445, 450, 456, 465

Education 520, 525, 530, 540, 545, 550, 556, 560

30 units (5.0 full-course equivalents) in courses in Teachable Subject Areas including:

Teachable Subject Area courses (24 units or 4.0 full-course equivalents)

Education 460, 535 (6 units or 1.0 full-course equivalents)

18 units (3.0 full-course equivalents) in required non-education required courses

Course in English or French Literature (3 units or 0.5 full-course equivalent)

Course in Creative and Performing Arts (3 units or 0.5 full-course equivalent)

Course in Psychology (3 units or 0.5 full-course equivalent)

Course in Physical Education or Health and Wellness (3 units or 0.5 full-course equivalent)

Course in Sciences (3 units or 0.5 full-course equivalent)

Course in Canadian Studies (3 units or 0.5 full-course equivalent)

15 units (2.5 full-course equivalents) in elective courses

Teachable Subject Areas

In addition to the required Education, non-Education, and elective courses, students are required to complete 24 units (4.0 full-course equivalents) in their teachable subject area as listed below. Students should consult with the Undergraduate Programs in Education Office for a list of approved or recommended courses.

Language Arts	24 units (4.0 full-course equivalents) in the area of English, of which 9 units (1.5 full-course equivalents) are at the senior level
Mathematics	24 units (4.0 full-course equivalents) in the area of Mathematics, of which 9 units (1.5 full-course equivalents) are at the senior level
Science	24 units (4.0 full-course equivalents) in the area of Science, Biology, Chemistry, or Physics, of which 9 units (1.5 full-course equivalents) are at the senior level
Social Studies	3 units (0.5 full-course equivalent) in the area of History 3 units (0.5 full-course equivalent) in the area of Geography 3 units (0.5 full-course equivalent) in the following areas: Anthropology, Archaeology, Canadian Studies, Economics, Indigenous Studies, Law and Society, Political Science, Psychology, Sociology, Religious Studies, Urban Studies, or Women's Studies 15 units (2.5 full-course equivalents) in a range of the following areas, of which 9 units (1.5 full-course equivalents) are at the senior level: Anthropology, Archaeology, Canadian Studies, Communication and Culture, Economics, Geography, History, Indigenous Studies, Law and Society, Political Science, Psychology, Sociology, Religious Studies, Urban Studies, or Women's Studies

4.3 Five-Year BEd (Concurrent) Program

The Werklund School of Education in partnership with the Faculties of Arts, Science, and Kinesiology offers a number of Five-Year BEd (Concurrent) degree programs.

The following Education courses must be completed. Consult with the partner faculty for the required non-Education courses.

Education 201 Introduction to Educational Studies

Education 420 Issues in Learning and Teaching

Education 427 Science, Technology, English and Mathematics (STEM)

Education 430 Pragmatics of Learning and Teaching

Education 435 Literacy, Language and Culture

Education 445 Individual Learning: Theories and Applications

Education 450 Diversity in Learning

Education 456 Assessment

Education 460 Specialization I

Education 520 Interdisciplinary Learning

Education 525 Ethics and Law in Education

Education 530 FNMI History, Education and Leadership

Education 535 Specialization II

Education 545 Curriculum I - Sciences, Kinesiology

Education 550 Curriculum II - Arts and Humanities

Education 556 Professional Development and Lifelong Learning

The following Field Experience courses must be completed successfully with a grade of "CR" (Completed Requirements):

Education 440 Field Experience I

Education 465 Field Experience II

Education 540 Field Experience III

Education 560 Field Experience IV

4.4 Two-Year BEd (Consecutive) Program

The following Education courses must be completed.

Education 420 Issues in Learning and Teaching

Education 427 Science, Technology, English and Mathematics (STEM)

Education 430 Pragmatics of Learning and Teaching

Education 435 Literacy, Language and Culture

Education 445 Individual Learning: Theories and Applications

Education 450 Diversity in Learning

Education 456 Assessment

Education 460 Specialization I

Education 520 Interdisciplinary Learning

Education 525 Ethics and Law in Education

Education 530 FNMI History, Education and Leadership

Education 535 Specialization II

Education 545 Curriculum I - Sciences, Kinesiology

Education 550 Curriculum II - Arts and Humanities

Education 556 Professional Development and Lifelong Learning

The following Field Experience courses must be completed successfully with a grade of "CR" (Completed Requirements):

Education 440 Field Experience I

Education 465 Field Experience II

Education 540 Field Experience III

Education 560 Field Experience IV

5. Administration

Faculty Administrative Officers

Dean

D. Sumara

Vice Dean

S. Friesen

Associate Deans

M. Jacobsen, Graduate Programs

C. Kawalilak, International

S. Friesen, Professional and Community Engagement (PACE)

N. Arthur, Research

J. Lock, Teaching & Learning

D. Gereluk, Undergraduate Programs

Continuing Education

1. Summary of Programs

Credit Programs

Continuing Education offers Workplace Learning as a minor field of study towards selected undergraduate degrees offered at the University of Calgary. The Minor in Workplace Learning program helps students develop the knowledge and skills they need to function effectively in a rapidly changing workplace and provides them with strategies to facilitate both their own and their colleagues' learning. The Minor in Workplace Learning is recognized as a degree minor in several University of Calgary Faculties including Arts, Kinesiology and Science. This minor field of study is composed of 30 units (5.0 full-course equivalents) or 400 hours of specified Continuing Education certificate credit.

See 4.1 Minor in Workplace Learning for more information.

Non-Degree Credit Programs

Continuing Education offers a wide range of seminars, courses, certificate programs, and professional designations to individuals seeking opportunities for professional development and personal enrichment, as well as to organizations seeking training for employees. Major programming areas include business and professional programs, languages, liberal arts, fine arts, adult education, and computer applications and technology.

Continuing Education provides educational opportunities for lifelong learners seeking superior quality programming and instruction. Courses and programs serve local, online, and international communities, and are aligned with the academic mandate of the University of Calgary.

Certificates/Designations

Continuing Education certificate courses have been developed with part-time learners in mind and are offered at convenient times and in formats suitable for adults. Most courses are taught in the classroom. Many are offered online or in a blended format – partly in the classroom and partly online. Some certificates can be achieved completely through online learning.

See conted.ucalgary.ca for more information.

2. Information

Contact Information

Location: Education Tower 1120 and Energy Resources Research Building 3512 – 33 Street N.W.

Student Information: 403.220.2866; 1.866.220.4992 (outside Calgary)

Email address: conted@ucalgary.ca

Website: conted.ucalgary.ca

Program Enquiries

Academic Preparation/ Adult Learning/ Fine Arts/Liberal Arts/Visual Design/ Writing

Telephone: 403.220.2952

Email: adedlife@ucalgary.ca

Business and Professional Programs

Telephone: 403.220.2988

Email: business.conted@ucalgary.ca

Languages: Arabic, Dutch, French, German, Greek, Italian, Japanese, Korean, Mandarin, Polish, Portuguese, Russian, Spanish and American Sign Language

Telephone: 403.220.2952

Email: language@ucalgary.ca

English Language Program (including full-time and part-time programs)

Telephone: 403.220.3301

Email: esl@ucalgary.ca

Website: ucalgary.ca/esl

Resources

Upgrading Courses (Academic Preparation)

Courses are offered through Continuing Education for students who require academic upgrading in Biology, Chemistry, English, Mathematics and Physics for admission to the University of Calgary. Information on admission to the University of Calgary may be found at: ucalgary.ca/prospectivestudents/.

3. Admission

Because of the wide diversity of programs administered, admission requirements, registration procedures and general regulations vary. It is recommended that prospective students contact the Continuing Education office to obtain detailed information regarding their areas of interest. (See Contact Information). Registrants must be 18 years of age or older to enrol and participate in a course offered through Continuing Education unless otherwise specified. Successful completion of a Grade 12 diploma and relevant work experience are recommended. If English is not your first language, please review the English language proficiency requirements. A degree or diploma are not typically required.

4. Program Details

4.1 Minor in Workplace Learning

Introduction

Continuing Education offers a Minor in Workplace Learning, which helps students develop the knowledge and skills they need to function effectively in a rapidly changing workplace as well as provides them with strategies to facilitate both their own and their colleagues' learning.

The Minor in Workplace Learning is recognized in several University of Calgary Faculties including Arts, Kinesiology and Science. A Minor field of study is composed of five full-course equivalents or 400 hours of specified certificate credit.

Requirements

In order to complete the requirements for a Minor in Workplace Learning, students must complete 400 hours of instruction. This requires completion of:

Business Management Certificate

(a) One of the 300-hour University of Calgary Management Certificate program (excluding Environmental Management); (b) 60 hours of instruction from an array of courses in the Certificate in Adult Learning; and (c) the "capstone" 40-hour course Learning in the Workplace; or

Certificate in Adult Learning

(a) The 300-hour University of Calgary Certificate in Adult Learning; (b) 60 hours of instruction from the wide range of courses offered in the Management Certificate program; and (c) the "capstone" 40-hour course Learning in the Workplace.

Other Requirements

1. Students must meet undergraduate admission requirements.

2. Successful completion of the 30 units (five full courses) of advanced credit (12 units (2.0 full-course equivalents) at the junior level and 18 units (3.0 full-course equivalents) at the senior level) for the Minor in Workplace Learning will be recorded with the designation “CR” instead of a grade. Calculation of a GPA will be based on the remaining courses taken to complete the degree.

3. The Minor in Workplace Learning will be recognized as transfer courses in your undergraduate program. Most University of Calgary degrees require at least half the courses to be counted toward the degree to be University of Calgary courses, not transfer courses. Please check with your undergraduate academic advisor to determine if there are any limitations on transferring

the Minor in Workplace Learning with other transfer credits you have been granted.

4. Students who have completed the 400-hour requirement for the Minor in Workplace Learning may be eligible for undergraduate credit whether or not the Minor is claimed.

5. Continuing Education is responsible for deciding the suitability for advanced credit of certificate programs from other institutions.

6. The Business Management Certificate courses on microeconomics and macroeconomics are treated as equivalent Economics 201 and 203. Students possessing Economics 201 and/or 203 may use these courses as part of their Minor in Workplace Learning or as courses towards a Major or Minor in Economics. Students electing the latter cannot also receive a Minor in Workplace Learning.

7. Students may take regular undergraduate courses prior to completing the Minor in Workplace Learning.

Courses of Instruction

How to Use

This section contains the descriptions of courses offered at the University of Calgary. The courses are arranged in alphabetical order by course title not by abbreviation. In order to better understand the notations used throughout this section, an illustrated example of a course description is provided.

All courses listed are not necessarily offered every year and students should consult the Schedule of Classes for an official listing of those courses that will be offered in a given term.

Since this Calendar is published a considerable time before the opening of the academic year, the University reserves the right to make whatever changes circumstances may require including the cancellation of a particular course.

Note: Access to graduate level courses (numbered 600 and above) for Visiting and Exchange students is limited to those admitted to a graduate program. For Open Studies and other students, access to graduate courses is restricted to those with adequate preparation, normally an undergraduate degree or the equivalent. Permission for an Open Studies or other student to register in any graduate level course must be obtained from the Faculty of Graduate Studies office.

Sample Course Description

See numbered footnotes for explanations of the information commonly provided in a course description.

Biology 241[1] **3 units; H(3-3)**[2]

Energy Flow in Biological Systems

An introduction to the energetics of life from molecules through ecosystems. Topics include: energy in biological systems; how different organisms obtain, store and use energy; energy budgets of organisms; and energy flow through cells and ecosystems.

Prerequisite:[3] Biology 30 and Chemistry 30.

Antirequisite:[4] Credit for Biology 241 and 205 will not be allowed. Credit for more than two of Biology 231, 233, 241, 243 will not be allowed.

Notes[5]: Biology 241 is a prerequisite for Biology 243. Not recommended for students seeking a single course, general-interest overview of the biological sciences. Those seeking such a course should consider Biology 205.

Some Courses may include the notations:

MAY BE REPEATED FOR CREDIT[6]

NOT INCLUDED IN GPA[7]

[1]**Course Numbers: e.g. Biology 241 (BIOL 241)**

The number of the course indicates the level of the course:

Supplementary study for degree: courses labelled in the 100s

Junior level: 200s

Senior level: 300s and 400s

Upper level undergraduate: 500s

Graduate level: 600s and 700s

To understand course acronyms, refer to the section "Courses of Instruction by Faculty".

[2]**Hours of Instruction: e.g. 3 units; H(3-3)**

We are transitioning to the sole use of "units" of course credit from the historical convention of "full-course equivalent" or "half-course equivalent" terminology. Fees and graduation are determined using "units". The unit weight of the course is indicated in the calendar by the first part of the course hours, e.g. "3 units; H".

The hours of instruction expected per week are indicated by the numbers contained in the brackets. The first number represents the number of lecture hours per week and the second number represents the number of lab hours per week. For example, (3-0) would indicate 3 hours of lectures per week and no labs. For (2-3), there would be 2 hours of lectures per week, along with 3 hours of lab per week. A course labelled (3-3/2) means that there are 3 hours of lecture per week and 3 hours of lab every other week.

A course may also have tutorial and/or seminar hours assigned. These are noted as (3-0-1T or 1S).

The expected hours of instruction per week may vary from course to course.

Guide to understanding course hours:

Number of Units	"Formerly Known as" Course Equivalents	Expected Weeks of Instruction	Range of Total Hours of Expected Instruction*
0.75	E – Eighth (0.12 Full-Course Equivalent)	3 weeks or less	Less than 13 hours
1.5	Q – Quarter (0.25 Full-Course Equivalent)	6.5 weeks	13 - 26 hours
3.0	H – Half (0.5 Full-Course Equivalent) or HCE	13 weeks	27 - 100 hours
6.0	F – (1.0 Full-Course Equivalent) or FCE	26 weeks	100 – 250 hours
9.0+	M – More than Full-Course Equivalent	N/A	Greater than 250 hours

**Range of total hours of expected instruction is based on current practice and approved course hours at the University of Calgary. Some courses may have approval to have units and hours outside of these ranges.*

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To calculate the total hours of expected instruction given the weekly course hours provided in the calendar, one should take the total expected weeks of instruction and multiply by the number of weekly hours in the brackets. For example, Biology 241 (3-3), the total expected lecture hours are 3 (hours) x 13 (weeks) = 39 hours, and similarly 3 x 13=39 lab hours. A course designated 6 units; F(2-0) would be 2 (hours) x 26 (weeks) = 52 hours, which may be taught over the course of two terms or entirely in one term, provided total hours equal 52. Courses may be taught during block week, in 3 week approved sessions, 6 week approved sessions, 13 week terms, over 26 weeks or 2 terms, or for approved non-standard dates. Whatever the duration of the course, the total instructional hours should remain the same. Courses that use blended learning teaching formats, may meet the required instructional hours using alternate methods such as online instruction. Courses indicated as independent study or independent research include an hourly designation expected of the student to full-fill their independent work and may not have scheduled instruction time. Practicum and field study courses may indicate the total hours of instruction in the brackets instead of a weekly designation used by other courses. For example, Nursing 289 has 6 units; F(247 hours) listed as the course hours.

[3]**Prerequisites:** Courses that must be completed or currently registered in before a student may be able to register in this course.

Note: All courses listed as a prerequisite assume a minimum grade of "C-", unless otherwise stated. When a number of units (full-course equivalents) is listed, it is assumed this is the minimum and that all "F" grades are excluded from this count.

Corequisites: Must be completed at the same time as this class.

[4]**Antirequisites:** Certain courses carry the notation "Not open to students with credit in course number XXX" or "Credit for course number XXX and course number XXX will not be allowed." Students may take these courses if they wish, but credit for both courses will not be granted towards their degree.

Some antirequisites may include cross-listed courses such as Cellular, Molecular and Microbial Biology 561 and Medical Science 561 or Nursing 221 and Kinesiology 259. These courses are listed under two faculties and can only be taken for credit from one faculty, but not both. The credit is determined by the student's registration in either class.

[5]**Notes:** This contains any information that may be helpful regarding enrolment in the course. Some examples are: "Enrolment in this course may be limited", "See Program Details in the Faculty of Science section of this Calendar", or: "This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped".

[6]**May Be Repeated for Credit**

Some courses are decimalized in order to accommodate different unique topics of study e.g. 499.01, 499.02. If this notation is present, students are allowed to take multiple topics belonging to one course number.

[7]**Not Included in GPA**

A course with this notation is graded as CR (Completed Requirements) or F (Fail). The course is not included in the calculation of the grade point average.

Courses of Instruction by Faculty

Faculty of Arts

African Studies AFST
American Sign Language ASL
Anthropology ANTH
Arabic Language and Muslim Cultures ALMC
Archaeology ARKY
Art ART
Art History ARHI
Arts ARTS
Arts and Science Honours ASHA
Canadian Studies CNST
Central and East European Studies CEST
Chinese CHIN
Communication and Culture CMCL
Communication and Media Studies COMS
Comparative Literature COLT
Dance DNCE
Development Studies DEST
Drama DRAM
Earth Science EASC
East Asian Language Studies EALS
East Asian Studies EAST
Economics ECON
English ENGL
Film FILM
Fine Arts FINA
French FREN
Geography GEOG
German GERM
Greek GREK
Greek and Roman Studies GRST
History HTST
Humanities HUMN
Indigenous Languages INDL
International Relations INTR
Israel Studies ISST
Italian ITAL
Japanese JPNS
Latin LATI
Latin American Studies LAST
Law and Society LWSO
Linguistics LING
Museum and Heritage Studies MHST
Music MUSI
Music Education MUED
Music Performance MUPF
Philosophy PHIL
Political Science POLI
Psychology PSYC
Religious Studies RELS
Romance Studies ROST
Russian RUSS
School of Creative and Performing Arts SCPA
Science, Technology and Society STAS
Slavic SLAV
Sociology SOCI
South Asian Studies SAST
Spanish SPAN

(continued on next page...)

Strategic Studies STST
Term Abroad Program TAP
Transportation Studies TRAN
Urban Studies UBST
Women's Studies WMST

Cumming School of Medicine

Community Health Sciences MDCH
Health and Society HSOC
Medical Science MDSC
Medicine MDCN

Faculty of Environmental Design

Architectural Studies ARST
Environmental Design EVDS
Environmental Design Architecture EVDA
Environmental Design Landscape EVDL
Environmental Design Planning EVDP

Haskayne School of Business

Accounting ACCT
Business and Environment BSEN
Business Technology Management BTMA
Energy Management ENMG
Entrepreneurship and Innovation ENTI
Finance FNCE
Human Resources and Organizational Dynamics HROD
Management Studies MGST
Marketing MKTG
Operations Management OPMA
Petroleum Land Management PLMA
Risk Management and Insurance RMIN
Strategy and Global Management SGMA
Tourism Management TOUR

Faculty of Kinesiology

Athletic Therapy ATTH
Dance Education DCED
Kinesiology KNES
Physical Education PHED

Faculty of Law

Law LAW

Faculty of Nursing

Nursing NURS

Schulich School of Engineering

Biomedical Engineering BMEN
Chemical Engineering ENCH
Civil Engineering ENCI
Computer Engineering ENCM
Electrical Engineering ENEL
Energy and Environment, Engineering ENEE
Energy Engineering ENER
Engineering ENGG
Environmental Engineering ENEN
Geomatics Engineering ENGO
Manufacturing Engineering ENMF
Mechanical Engineering ENME
Petroleum Engineering ENPE
Software Engineering for Engineers ENSF

Faculty of Science

Actuarial Science ACSC
Applied Mathematics AMAT
Astronomy ASTR
Astrophysics ASPH
Biochemistry BCEM
Biology BIOL
Cellular, Molecular and Microbial Biology CMMB
Chemistry CHEM
Computer Science CPSC
Ecology ECOL
Environmental Science ENSC
Geology GLGY
Geophysics GOPH
Marine Science MRSC
Mathematics MATH
Medical Physics MDPH
Nanoscience NANS
Neuroscience NEUR
Physics PHYS
Plant Biology PLBI
Pure Mathematics PMAT
Science SCIE
Space Physics SPPH
Statistics STAT
Zoology ZOOL

Faculty of Social Work

Social Work SOWK

Faculty of Veterinary Medicine

Veterinary Medicine VETM

Werklund School of Education

Education EDUC
Educational Psychology EDPS
Educational Research EDER

Collaborating Faculties

Community Rehabilitation (MD, SW) CORE
Indigenous Studies (AR, SW) INDG
Innovation (AR, EN, HA, SC) INNO
Interprofessional Health Education (KN, NU, SW) IPHE
Language (AR, ED) LANG
Software Engineering (EN, SC) SENG
Sustainable Energy Development (EN, EV, LA, HA) SEDV
Transportation Studies (AR, EN) TRAN

Other

Academic Writing ACWR
Co-operative Education COOP
Energy and Environmental Systems EESS
International Foundations Program IFPX
International Foundations Program Engineering IFPE
Public Policy PPOL
Internship INTE
University UNIV
University Exchange UNEX

Course Descriptions

Academic Writing ACWR

Instruction offered under the direction of the Department of Communication, Media and Film Studies.

Junior Courses

Academic Writing 201 **3 units; H(3-1T)**

Academic Writing for Specialized Audiences I (Introductory)
An introduction to academic writing and to the genres of narrative, critical, and essay writing. Emphasis will be placed on developing an effective writing process, reading critically, developing arguments, and using and citing sources. Some emphasis on oral presentations may be included.

Academic Writing 203 **3 units; H(3-1T)**

Academic Writing for Specialized Audiences II (Introductory)
An introduction to inquiry-based research writing, from formulating good research questions to conducting an information search, developing an argument, using sources effectively, and revising and editing. A focus on oral presentations may also be included.

Note: It is recommended, though not required, that students complete Academic Writing 201 before Academic Writing 203.

Senior Courses

Academic Writing 303 **3 units; H(3-0)**

Academic Writing for Specialized Audiences (Intermediate)
An intermediate level course in the writing styles, genres, and modes of evidence and reasoning appropriate to academic writing in a specific discipline or disciplines. Emphasis will be placed on connections between reading, writing, critical reasoning, and, where appropriate, other discourse forms such as oral and electronic presentation.

Prerequisite(s): Admission to Nursing, Medicine, Community Rehabilitation and Disability Studies, Bachelor of Health Sciences, or Social Work.

Note: This course is normally offered online.

Accounting ACCT

Instruction offered by members of the Haskayne School of Business.

Junior Course

Accounting 217 **3 units; H(3-1T)**

Introductory Financial Accounting
Introduction to accounting for business organizations. Reporting of financial results of operations and financial position to investors, managers, and others. Emphasis on the use of accounting information for decision making.

Prerequisite(s): Admission to the Haskayne School of Business Bachelor of Commerce program, and 12 units (2.0 full-course equivalents) including Mathematics 249 or 251 or 265 or 281.

Antirequisite(s): Credit for Accounting 217 and any of Accounting 301, 317 or Business and Environment 291 will not be allowed.

Senior Courses

Accounting 301 **3 units; H(3-0)**

Accounting Principles
Introduction to basic accounting principles and practices. Emphasis is placed on the accounting cycle and the key financial statements necessary for business decisions. Introduces basic financial and managerial accounting concepts.

Prerequisite(s): 24 units (4.0 full-course equivalents) including Entrepreneurship and Innovation 201.

Antirequisite(s): Credit for Accounting 301 and any of 217, 317 or 323 will not be allowed.

Note: Not available for credit towards the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor. This course will not act as a prerequisite for any higher level accounting course.

Accounting 323 **3 units; H(3-1T)**

Introductory Managerial Accounting
An introduction to the use of accounting within an organizational context. Emphasis is placed on the development and dissemination of accounting information necessary for effective management including: planning, directing, motivating, and controlling activities and behaviours.

Prerequisite(s): Admission to the Haskayne School of Business, and Accounting 217 or 317.

Antirequisite(s): Credit for Accounting 323 and 301 will not be allowed.

Accounting 341 **3 units; H(3-1T)**

Intermediate Financial Accounting I
Financial accounting from a producer point of view. Topics include cash, receivables, inventories, short and long-term investments, intangible assets and capital assets including the appropriate financial statement considerations.

Prerequisite(s): Admission to the Haskayne School of Business and Accounting 217 or 317, and 323.

Accounting 343 **3 units; H(3-1T)**

Intermediate Financial Accounting II
Financial accounting from a producer point of view. Topics include accounting for liabilities, shareholders equity, leases, future income taxes, pensions, accounting changes and earnings per share including the relevant financial statement considerations.

Prerequisite(s): Admission to the Haskayne School of Business and Accounting 341.

Accounting 361 **3 units; H(3-1T)**

Cost Accounting
The production of accounting data for the purpose of decision-making, control and evaluation. Topics covered are in the cost classifications and methods of cost establishment, cost data appropriate for decision models, standards and controls.

Prerequisite(s): Admission to the Haskayne School of Business and Accounting 323.

Accounting 421 **3 units; H(3-1T)**

Taxation
Taxation levied on profits, sales, property and estates and its impact upon management decisions. Consideration will be given to the biases and shifts implicit in any system of taxation.

Prerequisite(s): Admission to the Haskayne School of Business, and 54 units (9.0 full-course equivalents) including Accounting 217 or 317.

Accounting 423 **3 units; H(3-0)**

Advanced Taxation
Focuses on tax planning. Extends the material covered in the introductory tax course with an examination of specialized topics in personal and corporate income tax. Topics include detailed review of taxation of corporations, income trusts, partnerships, business reorganization, amalgamations, winding-up of businesses, sale of an incorporated business, tax consequences of leaving Canada and death of a taxpayer.

Prerequisite(s): Admission to the Haskayne School of Business and Accounting 421.

Accounting 425 **3 units; H(3-0)**

Auditing
A conceptual study of audit evidence, basic audit techniques, professional ethics, audit reports.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Accounting 341.

Accounting 443 **3 units; H(3-1T)**

Advanced Financial Accounting
Topics include accounting for business combinations and intercorporate investments, foreign currency transactions and translation, bankruptcy, partnerships, and not-for-profit organizations.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Accounting 343.

Accounting 445 **3 units; H(3-0)**

Accounting Theory
Examines the origins of financial accounting and current theories on the use of financial accounting information by investors, regulators, standard setters, and other corporate stakeholders.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Accounting 343.

Accounting 465 **3 units; H(3-0)**

Managerial Control Systems
Case approach to Management Control Systems explaining the use of accounting data from a managerial perspective. Emphasis is placed on how managers use planning and control to accomplish a firm's strategies.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Accounting 361.

Accounting 559 **3 units; H(3-0)**

Selected Topics in Accounting
Investigation of selected topics in Accounting.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Accounting 343.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Accounting 601 **3 units; H(3-0)**

Introductory Financial Accounting
Introduction to accounting for business organizations. Reporting of financial results of operations and financial position to investors, managers, and others. Emphasis on the use of accounting information for decision-making.

Accounting 603 **3 units; H(3-0)**

Management Accounting
Breakeven analysis, activity-based costing and management, budgeting, productivity measures,

and other tools and techniques that are part of a planning and control system that will help the manager make better economic decisions.

Prerequisite(s): Accounting 601.

Accounting 641 **3 units; H(3-0)**

Intermediate Financial Accounting I
Provides detailed coverage of the Generally Accepted Accounting Principles (GAAP) primarily related to assets. Emphasizes the theory behind the methods, the strengths and weaknesses of such methods and the need for sound professional judgment.

Prerequisite(s): Accounting 601 and 603; or consent of the Haskayne School of Business.

Accounting 643 **3 units; H(3-0)**

Intermediate Financial Accounting II
Builds on Intermediate Financial Accounting I with coverage of the Generally Accepted Accounting Principles (GAAP) primarily related to liabilities and owners' equity. Emphasizes the theory behind the methods, the strengths and weaknesses of methods and the need for sound professional judgment.

Prerequisite(s): Accounting 641.

Accounting 661 **3 units; H(3-0)**

Cost Accounting
Provides intermediate level discussions to the production and analysis of costs used for pricing, production and investment decisions, revenue analysis, performance evaluation, management incentive systems and strategy analysis.

Prerequisite(s): Accounting 603.

Accounting 721 **3 units; H(3-0)**

Taxation
Discusses the core concepts, regulations, and interpretations underlying the Canadian individual and corporate income taxation. Emphasis is on who is taxable, on what income, when and how tax is calculated. Tax planning opportunities will be identified by using long-term and clientele-based techniques.

Prerequisite(s): Accounting 601.

Accounting 723 **3 units; H(3-0)**

Advanced Taxation
Focuses on tax planning. It extends the material covered in the introductory tax course with an examination of specialized topics in personal and corporate income tax.

Prerequisite(s): Accounting 721.

Accounting 725 **3 units; H(3-0)**

Auditing
Discusses the techniques and theory behind the external auditor's provision of assurance services on financial information. Topics include: the demand for assurance, the role of auditors in providing assurance, auditor independence, audit reports, and audit liability.

Prerequisite(s): Accounting 641.

Accounting 741 **3 units; H(3-0)**

Financial Statement Analysis
Covers the theories, concepts and practices of financial statement analysis with an emphasis placed on applications.

Prerequisite(s): Accounting 603.

Accounting 743 **3 units; H(3-0)**

Advanced Financial Accounting
Focuses on advanced accounting methods related to inter-corporate investments and financial reporting. Topics include accounting for business combinations and inter-corporate investments, foreign currency transactions and translation, bankruptcy, partnerships, and not-for-profit organizations.

Prerequisite(s): Accounting 643.

Accounting 745 **3 units; H(3-0)**

Accounting Theory
Examines the conceptual framework underlying the preparation of financial accounting information, and the theories and propositions on the use of such information by investors, regulators, standard setters, and other corporate stakeholders.

Prerequisite(s): Accounting 643.

Accounting 765 **3 units; H(3-0)**

Managerial Control Systems
Emphasis is placed on how managers use planning and control to accomplish a firm's strategies. Uses a case approach to management control systems explaining the usefulness of accounting data from a managerial perspective.

Prerequisite(s): Accounting 661.

Accounting 789 **3 units; H(3S-0)**

Seminar in Accounting
Development of and solutions to current issues and problems in accounting.

Prerequisite(s): Accounting 603 or consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Accounting 797 **3 units; H(3S-0)**

Advanced Seminar in Accounting
Advanced accounting research topics.

Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

PhD Course

Accounting 799 **3 units; H(3S-0)**

Doctoral Seminars in Accounting
799.01. Seminar in Financial Accounting

799.02. Seminar in Managerial Accounting

799.04. Seminar in Taxation

Actuarial Science ACSC

Instruction offered by members of the Department of Mathematics and Statistics in the Faculty of Science.

Notes:

For listings of related courses, see also Applied Mathematics, Mathematics, Pure Mathematics, and Statistics.

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 replaces Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

Senior Courses

Actuarial Science 325 **3 units; H(3-1T)**

Theory of Interest/Mathematics of Finance
Measurement of interest, elementary annuities, general annuities, amortization schedules and sinking funds, bonds and other securities.

Prerequisite(s): One of Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219; or one of Mathematics 249 or 251 or 265 or 275 or 281 or Applied Mathematics 217 and consent of the Department.

Note: Actuarial Science 325 is strongly recommended as a prerequisite.

Actuarial Science 327 **3 units; H(3-1T)**

Life Contingencies I
The survival function, force of mortality, life tables, analytical laws of mortality, life insurance, continuous and discrete life annuities, recursion equations. Introduction to benefit premiums and/or insurance and annuity models with interest as a random variable as time permits.

Prerequisite(s): A grade of "C" or higher in Statistics 321 or Mathematics 321.

Note: Actuarial Science 325 is strongly recommended as a prerequisite.

Actuarial Science 425 **3 units; H(3-0)**

Intermediate Topics in Finance and Investment
Selected topics relevant to students with an interest in actuarial science, enterprise risk management, financial mathematics, etc. Topics include financial instruments; sources and cost of capital; portfolio selection; CAPM and alternatives; dividend policy; taxation; basic option pricing theory; stock valuation; measurement and assessment of financial performance; risk management.

Prerequisite(s): Actuarial Science 325 and Statistics 323 or Mathematics 323; or Actuarial Science 325 and 60 units (10 full-course equivalents) and consent of the Department.

Antirequisite(s): Credit for Actuarial Science 425 and Finance 317 will be not be allowed without consent of the Department.

Note: Students with credit for Finance 317 but requiring Actuarial Science 425 for VEE credit from the Society of Actuaries should consult with the Department.

Actuarial Science 427 **3 units; H(3-0)**

Life Contingencies II
Benefit premiums, premium principles, fully continuous and fully discrete premiums. Benefit reserves and their analysis. Insurance models including expenses. Multiple-state models.

Prerequisite(s): Actuarial Science 327; and Statistics 323 or Mathematics 323; and one of Mathematics 353 or 367 or 377 or 381.

Actuarial Science 437 (formerly Statistics 437) **3 units; H(3-0)**

Actuarial Models
Basic distributional quantities; characteristics of actuarial models; continuous models; Basic and advanced discrete distributions; frequency and severity with coverage modifications (deductibles, policy limits, coinsurance); aggregate loss models.

Prerequisite(s): Statistics 321 or Mathematics 321.

Actuarial Science 511 **3 units; H(3-0)**

Generalized Linear Models for Actuaries
Description of insurance data, response distributions, exponential family responses and estimation,

GLMs, models for count data, categorical and continuous responses. Applications include: personal injury insurance, vehicle insurance, diabetes deaths, third party claims, and degree of vehicle crash. Software for fitting GLMs will be discussed.

Prerequisite(s): Statistics 323 or Mathematics 323.

Note: Statistics 429 is recommended as a corequisite or prerequisite.

Actuarial Science 513 **3 units; H(3-0)**

Fundamentals of Actuarial Practice
An introduction to the foundations of actuarial science including the history and development of insurance, the actuarial profession, and the professional societies. Standards of practice and codes of ethics and conduct. An examination of the contexts and environments (including the legal, political, and societal) in which actuarial work takes place.

Prerequisite(s): Actuarial Science 327; and Statistics 321 or Mathematics 321.

Antirequisite(s): Credit for Actuarial Science 513 and 539.02 will not be allowed.

Actuarial Science 515 **3 units; H(3-0)**

Models for Financial Economics
Survey of financial derivatives, valuation of derivatives using binomial trees, Black-Scholes-Merton equation, dynamic hedging, Brownian motion and Ito's Lemma.

Prerequisite(s): Actuarial Science 325; and Statistics 321 or Mathematics 321.

Antirequisite(s): Credit for Actuarial Science 515 and 539.04 will not be allowed.

Actuarial Science 517 **3 units; H(3-0)**

Estimating Unpaid Claims in General Insurance
Data collection, adjusting premiums, trending losses, development triangles, expected method, frequency -severity method, Bornhuetter Ferguson method, Benktander method, Cape Cod method, impact of changing conditions on projection method.

Prerequisite(s): Actuarial Science 327.

Antirequisite(s): Credit for Actuarial Science 517 and 539.06 will not be allowed.

Actuarial Science 519 **3 units; H(3-0)**

Quantitative Financial Risk Management
Risk measures, correlations and copulas, various approaches to modelling market and credit risk, liquidity risk, enterprise risk management.

Prerequisite(s): Actuarial Science 327.

Actuarial Science 527 **3 units; H(3-0)**

Life Contingencies III
Multiple life functions, dependent and independent models, related annuities and insurances. Multiple decrement models: time until and causes of death. Associated single decrement tables. Applications of multiple decrement theory. Asset shares. Business and regulatory considerations.

Prerequisite(s): Actuarial Science 327; and Statistics 323 or Mathematics 323; and one of Mathematics 353 or 367 or 377 or 381.

Actuarial Science 531 **3 units; H(3-0)**

Loss Distributions and Their Estimations
Review of mathematical statistics; estimation based on complete and modified data; frequentist estimation; Bayesian estimation; simulation in actuarial modelling; model selection.

Prerequisite(s): Actuarial Science 327; and Statistics 323 or Mathematics 323; and one of Mathematics 353 or 367 or 377 or 381.

Antirequisite(s): Credit for Actuarial Science 531 and 533 will not be allowed.

Note: Actuarial Science 437 or Statistics 437 is strongly recommended as a prerequisite.

Actuarial Science 535 **3 units; H(3-0)**

Mathematics of Demography
Conventional and adjusted measures of mortality; measures of fertility; measures of morbidity; North American demographic characteristics and trends; evaluation of demographic data; projections for stable and stationary populations; actuarial applications of demographic characteristics and trends.

Prerequisite(s): Actuarial Science 327; and Statistics 323 or Mathematics 323.

Actuarial Science 537 **3 units; H(3-0)**

Credibility Theory
Limited fluctuation credibility; full and partial credibility; greatest accuracy credibility; Bayesian methodology; credibility premium; Buhlmann model; Buhlmann-Straub model; empirical Bayes method; bonus-malus system.

Prerequisite(s): Actuarial Science 327; and Statistics 323 or Mathematics 323; and one of Mathematics 353 or 367 or 377 or 381.

Antirequisite(s): Credit for Actuarial Science 537 and 533 will not be allowed.

Note: Actuarial Science 437 or Statistics 437 is strongly recommended as a prerequisite.

Actuarial Science 539 **3 units; H(3-0)**

Special Topics in Actuarial Science
Offered under various subtitles.

Prerequisite(s): Actuarial Science 327; and Statistics 323 or Mathematics 323; and one of Mathematics 353 or 367 or 377 or 381.

MAY BE REPEATED FOR CREDIT

African Studies AFST

Instruction offered under the direction of the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Senior Courses

African Studies 301 **3 units; H(3-0)**

Introduction to African Studies
An interdisciplinary perspective on the people and ecologies of the African continent. The major theme will be the processes and effects of social, religious, political, economic, historical and cultural change on the lives of Africans.

African Studies 400 **6 units; F(9-0)**

Field Study in Africa
A field course for the in situ interdisciplinary study of a country or region of Africa, emphasizing the geographical, archaeological, historical, cultural, political, economic and artistic aspects. For further information students should contact the Academic Programs Office or the Program Co-ordinator.

Prerequisite(s): Consent of the Program Co-ordinator.

African Studies 501 **3 units; H(3S-0)**

Seminar
Study of a particular topic(s) or region(s) from an interdisciplinary and comparative perspective. Students will be required to examine how political, social, economic and cultural factors intersect to shape various issues in the African setting.

Prerequisite(s): One of African Studies 301, Anthropology 317, History 401, or Political Science 371.

American Sign Language ASL

Instruction offered by members of the Department of Linguistics, Languages and Cultures in the Faculty of Arts.

American Sign Language 201 **3 units; H(3-1)**

Beginners' American Sign Language I
Introduction to American Sign Language (ASL) and the culture of deaf people. Covers material in matriculation-level ASL. It teaches basic communication and conversational skills in ASL and is for students with no background in ASL.

Note: Preference in enrolment is given to students in Medicine, Nursing, and Social Work.

American Sign Language II 203 **3 units; H(3-1)**

Beginners' American Sign Language II
Continuation of American Sign Language 201.

Prerequisite(s): American Sign Language 201.

Note: Preference in enrolment is given to students in Medicine, Nursing, and Social Work.

Anthropology ANTH

Instruction offered by members of the Department of Anthropology and Archaeology in the Faculty of Arts.

Junior Courses

Anthropology 201 **3 units; H(3-0)**

Introduction to Primatology and Human Evolution
Introduction to evolutionary theory and processes, with particular reference to the primates. Topics include primate taxonomy, distribution, reproduction, locomotion, diet, social organization, and evolution, with special emphasis on the path of human evolution.

Anthropology 203 **3 units; H(3-0)**

Introduction to Social and Cultural Anthropology
The nature of human society: its elements, its variability and its perpetuation. Conclusions will be drawn from comparisons of institutions (political, economic, religious, educational and sexual) in both small-scale and large-scale societies.

Anthropology 213 **3 units; H(3-0)**

Contemporary Aboriginal Issues in Canada
An exploration of the history of Aboriginal state relations, the development of Indian policy, and current efforts of Aboriginal peoples to address historical matters through the critique of the reserve system, residential schools and the pursuit of self-government, land claims, modern treaties and Aboriginal rights.

Senior Courses

Anthropology 303 **3 units; H(3-0)**

Business in Cultural Context
Ways in which differences in cultural values and practices affect the form and nature of interaction between business parties, especially those of differing national/cultural/ethnic backgrounds.

Anthropology 309 **3 units; H(3-1)**

Human Evolution
Investigation of the major phases of human evolution, with an emphasis on understanding how, when and why specific adaptations evolved. In laboratories, students learn to reconstruct behaviour from anatomical and palaeontological evidence.

Prerequisite(s): Anthropology 201.

Antirequisite(s): Credit for Anthropology 309 and 505.11 will not be allowed.

Anthropology 311 **3 units; H(3-0)**

Primate Behaviour
Primate behaviour and related topics: social dynamics, sociobiology, socio-ecology, dominance, aggression, kinship, sexual behaviour, socialization, learning, cognition, communication, ape language, and conservation.

Anthropology 313 **3 units; H(3-0)**

Anthropology of the Environment
Cross-cultural study of human-environment relationships and their application to contemporary problems concerning environmental issues, resource management, and sustainable development.

Prerequisite(s): Anthropology 203.

Antirequisite(s): Credit for Anthropology 313 and 399.03 will not be allowed.

Anthropology 317 **3 units; H(3-0)**

Ethnographic Survey of Africa South of the Sahara
Traditional societies in sub-Saharan Africa, concentrating on a number of classical social anthropological field work studies.

Prerequisite(s): Anthropology 203.

Anthropology 319 **3 units; H(3-0)**

Ethnographic Survey of North Africa
Ethnographic survey of the peoples of North Africa, including the Sahara, and historical analysis of their incorporation within the contemporary nation states of the region.

Prerequisite(s): Anthropology 203.

Anthropology 321 **3 units; H(3-0)**

Ethnographic Survey of Latin America
A survey of cultural traditions of Mexico, the Caribbean, and Central and South America as they have evolved since the sixteenth century.

Prerequisite(s): Anthropology 203.

Anthropology 323 **3 units; H(3-0)**

Culture and Society of China
Diversity of social and cultural patterns in imperial and contemporary times.

Prerequisite(s): Anthropology 203.

Anthropology 329 **3 units; H(3-0)**

Ethnographic Survey of Selected World Areas
Arranged for various topics in the anthropology of world areas. Consult department for topics in any given year.

Prerequisite(s): Anthropology 203.

MAY BE REPEATED FOR CREDIT

Anthropology 331 **3 units; H(3-0)**

Sex and Gender
Cross-species and cross-cultural perspective on sex and gender.

Anthropology 333 **3 units; H(3-0)**
(formerly Anthropology 433)

Working in Anthropology
Introduction to the practical use of anthropological knowledge and research methods. Includes discussion of the specific challenges of practicing anthropology outside of academia.

Prerequisite(s): Anthropology 203.

Anthropology 341 **3 units; H(3-0)**

Medical Anthropology
A survey of anthropological approaches to disease, illness and the maintenance of health.

Prerequisite(s): Anthropology 203.

Anthropology 343 **3 units; H(3-0)**

Militarism and Militarization
Comparative global ethnographic survey of militarization processes. Examples will be drawn from contemporary and historical societies, with a particular emphasis on the wide variety of institutions and communities necessary to the production of violence, and on their relationship to the larger society.

Prerequisite(s): Anthropology 203.

Antirequisite(s): Credit for Anthropology 343 and 315 will not be allowed.

Anthropology 349 **3 units; H(3-0)**

Anthropology of HIV/AIDS
Examines the individual, clinical, epidemiological, cultural, social, psychological, political, economic, and public policy dimensions of HIV/AIDS along with its meaning and importance on a global level from an anthropological perspective.

Prerequisite(s): Anthropology 203

Antirequisite(s): Credit for Anthropology 349 and 399.01 will not allowed.

Anthropology 355 **3 units; H(3-0)**

An Ethnographic Survey of Native North America
Selected North American Aboriginal cultures in terms of the relationships among basic subsistence adaptations, social, ceremonial, and ideological structures.

Prerequisite(s): Anthropology 203.

Anthropology 357 **3 units; H(3-0)**

Anthropology of Development
Cultural dimensions of local and international development policy, programming, and evaluation.

Prerequisite(s): One of Anthropology 203, Development Studies 201 or Indigenous Studies 201.

Anthropology 361 **3 units; H(3-0)**
(formerly Anthropology 461)

History of Anthropology
Historical survey of anthropological thought from the enlightenment to the present.

Prerequisite(s): Anthropology 203.

Anthropology 363 **3 units; H(3-0)**

Magic, Witchcraft, and Gods: Anthropology of Religion
Contemporary anthropological theoretical perspectives on topics such as divination, ritual, witchcraft, magic and symbolism in both indigenous and world religions. The relationship of religion to healing, gender and power is also examined.

Prerequisite(s): Anthropology 203.

Anthropology 371 **3 units; H(3-0)**
(formerly Anthropology 471)

Political Anthropology
Comparative analysis of power, authority, dependency relations, and processes of governance, from the perspective of social and cultural anthropology.

Prerequisite(s): Anthropology 203.

Anthropology 375 **3 units; H(3-0)**
(formerly Anthropology 475)

Anthropology of Law
Systems of law and social control in both state and non-state societies.

Prerequisite(s): Anthropology 203.

Anthropology 379 **3 units; H(3-0)**

Urban Anthropology
A study of tribalism, ethnicity, sub-cultures, social networks and related phenomena in urban societies. Attention will be paid to planning and applied urban anthropology.

Prerequisite(s): Anthropology 203.

Anthropology 385 **3 units; H(3-0)**
(formerly Anthropology 485)

Economic Anthropology
Comparative analysis of production, distribution and consumption in small-scale and complex societies; theories of exchange; effects of capitalism upon traditional economies and social organization.

Prerequisite(s): Anthropology 203.

Anthropology 391 **3 units; H(3-0)**

Anthropological Theory
Study of a variety of theories in Social and Cultural Anthropology, and their implications for research design and field work.

Prerequisite(s): Anthropology 203.

Antirequisite(s): Credit for Anthropology 391 and 365 will not be allowed.

Anthropology 393 **3 units; H(3-0)**

Ethnography of Global-Local Dynamics
Changes in the international division of labour and resulting social, cultural, and political effects.

Prerequisite(s): Anthropology 203.

Antirequisite(s): Credit for Anthropology 393 and 387 will not be allowed.

Anthropology 399 **3 units; H(3-0)**

Special Topics in Anthropology
Examination of select problems in Anthropology. Topics may be drawn from all subfields in the discipline.

MAY BE REPEATED FOR CREDIT

Anthropology 402 **6 units; F(3-0)**

Independent Study
Selected topics in anthropology to be offered to Majors and Honours in their fourth year. Topics for each student to be arranged on the basis of special interest and need.

Prerequisite(s): Consent of the Department.

Anthropology 404 **6 units; F(3-0)**

Independent Study
Selected topics in anthropology to be offered to Majors and Honours in their fourth year. Topics for each student to be arranged on the basis of special interest and need.

Prerequisite(s): Consent of the Department.

Anthropology 405 **3 units; H(3-0)**

Ecology of Tropical Forest Societies
Adaptation of indigenous societies to their tropical forest habitat, and their transformation under the impact of industrial society.

Prerequisite(s): Anthropology 203.

Anthropology 411 **3 units; H(3-0)**

Methods and Analysis for Anthropology
An introduction to research design, data collection, and analysis as used in anthropology. Cross-cultural research design and methods, use of participant observation and personal documents will be emphasized.

Prerequisite(s): Anthropology 391.

Anthropology 413 **3 units; H(3-3)**

Method in Primatology
Focus on observational methods and analysis, with practical application in laboratory study at the Calgary Zoo.

Prerequisite(s): Anthropology 311.

Antirequisite(s): Credit for Anthropology 413 and 351 will not be allowed.

Note: Field trips required.

Anthropology 421 **3 units; H(3-0)**

Contemporary Latin American Society
An examination of selected issues in the anthropological study of contemporary Latin America.

Prerequisite(s): Anthropology 321.

Anthropology 425 **3 units; H(3-0)**

Primate Cognition
Causes and consequences of primate sociality, such as brain structure and evolution, kin recognition, Theory of Mind, social perception and awareness, and similarities and differences in communication and cognition between human and non-human primates.

Prerequisite(s): Anthropology 311.

Antirequisite(s): Credit for Anthropology 425 and 505.03 will not be allowed.

Anthropology 427 **3 units; H(3-0)**

Women in East Asian Societies
Comparison of women's roles in China, Japan, and Korea, with particular reference to family structure and economic organization.

Prerequisite(s): Anthropology 323.

Anthropology 435 **3 units; H(3-0)**

Evolutionary Anthropology
Analysis of evolutionary principles and processes (such as natural selection, sexual selection, kin selection, parental investment) as they are applied to the current study of human and non-human primate behaviour. Special emphasis on socioecological approaches to primate behaviour.

Prerequisite(s): Anthropology 311.

Anthropology 441 **3 units; H(3-0)**

Problems in the Anthropology of Health
An examination of select problems in the anthropology of health. Topics of course assignments include models of health in Canada, etiological claims in health research, and anthropology of pharmaceuticals.

Prerequisite(s): Anthropology 341.

Anthropology 451 **3 units; H(3-0)**

Topics in Primate Behavioural Ecology and Conservation
Advanced topics in the behavioural ecology and conservation biology of non-human primates, including related theory and field techniques.

Prerequisite(s): Anthropology 311.

MAY BE REPEATED FOR CREDIT

Anthropology 467 **3 units; H(3-0)**

Soldiering: Perspectives on Military Life
An anthropological approach to soldiering in the aftermath of the Second World War. Questions the idea of a universal soldier, soldiers' shifting relationship to the nation-state, the rise of privatized warfare and the creation of global military communities. Special attention will be paid to the rise of humanitarian military regimes, military occupation, new technologies of warfare and non-human soldiers.

Prerequisite(s): Anthropology 343.

Anthropology 479 (Geography 479) **3 units; H(3-0)**

Housing and Society
Examines interactions between housing and social organization in cross-cultural context. Emphasizes the varied types of built form, their cultural meanings, implications for social life within households and for society more broadly, and their political and economic consequences. Pays particular attention to contemporary housing problems such as homelessness and urban sprawl.

Prerequisite(s): Anthropology 379 or Geography 351.

Anthropology 501 **3 units; H(3-0)**

Conference Course in Anthropology
Arranged for various topics of anthropology on the basis of special interest and need.

Prerequisite(s): Anthropology 203 and one additional senior Anthropology course and consent of the Department.

MAY BE REPEATED FOR CREDIT

Anthropology 505 **3 units; H(3-0)**

Conference Course in Primatology
Arranged for various topics of primatology on the basis of special interests and need.

Prerequisite(s): Anthropology 311 and one additional senior primatology course and consent of the Department.

MAY BE REPEATED FOR CREDIT

Anthropology 523 (Archaeology 523) **3 units; H(3-0)**

Human Ecology
Current directions in various subfields of human ecology as they apply to Anthropology, Archaeology, and Geography.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Anthropology 523 and Geography 523 will not be allowed.

Anthropology 535 **3 units; H(3-0)**

History and Theory in Primatology and Physical Anthropology
Historical and theoretical survey of ideas about the biological bases of human and non-human primate social behaviour. Impacts of the theoretical models of the modern synthesis, ethology, behavioural ecology, socio-ecology, and sociobiology or the study of human and non-human primates.

Prerequisite(s): Anthropology 413.

Anthropology 541 **3 units; H(3-0)**

Field Study in Social and Cultural Anthropology
Research projects carried out off campus, under the supervision of a member of academic staff, and resulting in a graded project report.

Prerequisite(s): Consent of the Department.

Anthropology 552 **6 units; F(3-3)**

Field Studies in Primatology
Intensive training and practice in field methods of observational primate behaviour or behavioural ecology.

Prerequisite(s): Anthropology 413 and consent of the Department.

Corequisite(s): Anthropology 553.

Note: Normally offered during Spring Intersession.

MAY BE REPEATED FOR CREDIT

Anthropology 553 **3 units; H(3-3)**

Primate Behavioural Research Design
Design of a research project, including the identification and operationalization of a research question and the collection and analysis of data.

Prerequisite(s): Anthropology 413 and consent of the Department.

Corequisite(s): Anthropology 552.

Note: Normally offered during Spring Intersession.

MAY BE REPEATED FOR CREDIT

Anthropology 571 **3 units; H(3-0)**

Honours Seminar in Primatology
Current theoretical and methodological issues will be explored in a discussion-based seminar format.

Prerequisite(s): Anthropology 413 and admission to the Anthropology Honours Program.

Anthropology 573 **3 units; H(3-0)**

Honours Seminar in Social and Cultural Anthropology
Current theoretical and methodological issues will be explored in a discussion-based seminar format,

with the possibility of development of a research project.

Prerequisite(s): Anthropology 411 and admission to the Anthropology Honours Program.

Anthropology 589 (Archaeology 589) **3 units; H(3-0)**

Nutritional Anthropology
The study of human dietary practices from biological and cultural perspectives. Subjects covered include the development of nutritional anthropology, principles of nutrition, principles of ecology, diet from an evolutionary, comparative and historic perspective, the impact of undernutrition on human physiology, and behaviour and methods in nutritional anthropology.

Prerequisite(s): One of Anthropology 201 or Archaeology 203 or Archaeology 305 and consent of the Department.

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Anthropology 601 **3 units; H(3-0)**

Conference Course in Anthropology
A specialized area of Anthropology selected on the basis of particular interest and need.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Anthropology 603 **3 units; H(3S-0)**

Thesis Development
A reading and conference course in the student's substantive area conducted jointly by at least two faculty members.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Anthropology 605 **3 units; H(3-0)**

Professional Skills for Anthropologists
Training and practice in research/teaching skills: grantsmanship, conference and classroom presentations, academic publishing, job interviews.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Anthropology 605 and 601.90, or the equivalent, will not be allowed.

NOT INCLUDED IN GPA

Anthropology 611 **3 units; H(3-0)**

Methods in Anthropological Research
A variety of topics relevant to research and the logic of inquiry in Anthropology.

Prerequisite(s): Consent of the Department.

Anthropology 613 **3 units; H(3-0)**

Current Issues in Methodology in Primatology
A variety of topics relating to aspects of data collection and data analysis in primatology, with a focus on ecological and behavioural data.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Anthropology 631 **3 units; H(3-0)**

Anthropological Theory
Prerequisite(s): Consent of the Department.

Anthropology 635 **3 units; H(3-0)**

Primatological Theory
Seminar dealing with the theoretical material of primatological and biobehavioural perspectives in Anthropology.

Prerequisite(s): Consent of the Department.

Anthropology 641 **3 units; H(3-0)**

Seminar in Civil-Military Relations
Comparative analysis of relations between civil society and military institutions. A critical approach to analyzing how civil and military institutions mutually constitute each other, rather than taking the military and civilian sectors as a given. Special attention will be paid to twentieth century militarization as a social process that has dramatically changed the shape of both civilian and military spheres.

Prerequisite(s): Consent of the Department.

Anthropology 659 **3 units; H(3-3)**

Primatology
Specialized topics and laboratory training in this field will vary from year to year and may include: behavioural ecology, biomechanics, evolution, biosociality, and field methodology.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Anthropology 701 **3 units; H(3-0)**

Independent Studies
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Applied Mathematics AMAT

Instruction offered by members of the Department of Mathematics and Statistics in the Faculty of Science.

Notes:

For listings of related courses, see Actuarial Science, Mathematics, Pure Mathematics and Statistics.

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 replaces Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

Senior Courses

Applied Mathematics 311 **3 units; H(3-1T)**

Differential Equations I
Classification of ordinary differential equations, first and second order equations with applications, series solutions about regular points and singular points, special functions, Laplace transform.

Prerequisite(s): Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219.

Antirequisite(s): Credit for Applied Mathematics 311 and either Mathematics 375 or Applied Mathematics 307 will not be allowed.

Applied Mathematics 411 **3 units; H(3-1T)**

Differential Equations II
Existence and uniqueness theorems, comparison and oscillation theorems, Green's functions, Sturm-Liouville problems, systems of equations, phase portraits, stability.

Prerequisite(s): One of Mathematics 375, Applied Mathematics 311 or 307; and one of Mathematics 331, 353, 367, 377, 381, Applied Mathematics 309.

Note: It is recommended that students complete Mathematics 335 or 355 or Pure Mathematics 435 or 455 before taking this course.

Applied Mathematics 413 **3 units; H(3-1T)**

Introduction to Partial Differential Equations
First order partial differential equations, Sturm-Liouville systems, Fourier series, Double Fourier series, Fourier integrals, Applications to boundary value problems in bounded and unbounded domains, Bessel function with applications.

Prerequisite(s): Mathematics 375 or 331 or one of Mathematics 353, 367, 381, Applied Mathematics 309 and one of Applied Mathematics 307 or 311.

Antirequisite(s): Credit for Applied Mathematics 413 will not be allowed in the Actuarial Science, Applied Mathematics, General Mathematics, Pure Mathematics, Statistics programs, and the Natural Sciences program with a Concentration in General Mathematics.

Applied Mathematics 415 **3 units; H(3-1T)**

Mathematical Methods
Mathematical analysis of linear systems. Fourier and Laplace transforms, applications and numerical methods. Functions of a complex variable and applications.

Prerequisite(s): One of Applied Mathematics 311, 307, Mathematics 331, 353, 367, 375, 381, or Applied Mathematics 309.

Antirequisite(s): Credit for Applied Mathematics 415 in the Actuarial Science, Applied Mathematics, General Mathematics, Pure Mathematics, Statistics, and the Natural Sciences program with a Concentration in General Mathematics will be not be allowed.

Note: Credit in an introductory Computer Science course is highly recommended as a prerequisite.

Applied Mathematics 425 **3 units; H(3-1T)**

Introduction to Optimization
Examples of optimization problems. Quadratic forms, minimum energy and distance. Least squares, generalized inverse. Location and classification of critical points. Variational treatment of eigenvalues. Lagrange multipliers. Linear programming.

Prerequisite(s): Mathematics 311 or 313; and one of Mathematics 331 or 353 or 367 or 377 or 381 or Applied Mathematics 309.

Applied Mathematics 433 **3 units; H(3-1T)**

Mathematical Methods in Physics
Fourier analysis. Laplace Transforms. Partial differential equations. Complex analysis. Residue integrals. Extensive physical applications.

Prerequisite(s): Mathematics 211 or 213 and one of Applied Mathematics 307 or 311 or Mathematics 375; and one of Applied Mathematics 309 or Mathematics 353 or 367 or 377 or 381 or 331.

Antirequisite(s): Credit for Applied Mathematics 433 in the Actuarial Science, Applied Mathematics, General Mathematics, Pure Mathematics, Statistics programs, and the Natural Sciences program with a Concentration in General Mathematics will be not be allowed.

Applied Mathematics 481 3 units; H(3-1T)

Introduction to Mathematical Finance
This course is an introduction to the fundamental concepts of mathematical finance in an elementary setting. Topics include: risk, return, no arbitrage principle; basic financial derivatives: options, forwards and future contracts; risk free assets, time value of money, zero coupon bonds; risky assets, binomial tree model, fundamental theorem of asset pricing; portfolio management and capital asset pricing model; no arbitrage pricing of financial derivatives; hedging.

Prerequisite(s): Mathematics 321 or Statistics 321.

Applied Mathematics 491 3 units; H(3-1T)

Numerical Analysis I
Interpolation and approximation, numerical integration, numerical methods for the solution of non-linear equations, systems of linear equations and the eigenvalue problem.

Prerequisite(s): Computer Science 231 or 217; and Mathematics 311 or 313; and one of Mathematics 381 or 367 or 377 or 349 and 353 or Applied Mathematics 309.

Antirequisite(s): Credit for Applied Mathematics 491 and Computer Science 491 will not be allowed.

Applied Mathematics 493 3 units; H(3-1T)

Numerical Analysis II
Numerical differentiation, numerical solution of ordinary and partial differential equations.

Prerequisite(s): Applied Mathematics 311 and 413; and Applied Mathematics 491 or Computer Science 491.

Applied Mathematics 501 3 units; H(3-0)

Seminar in Applied Mathematics
Topics will be chosen according to the interests of instructors and students and could include analysis of optimization algorithms, approximation theory, control theory, differential equations, mathematical physics.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Applied Mathematics 503 3 units; H(3-0)

The Mathematics of Wavelets, Signal and Image Processing
Continuous and discrete Fourier transforms, the Fast Fourier Transform, wavelet transforms, multi-resolution analysis and orthogonal wavelet bases, and applications.

Prerequisite(s): Applied Mathematics 491 or Computer Science 491.

Applied Mathematics 505 3 units; H(3-0)

Calculus on Manifolds
Integral and differential calculus on manifolds including tensor fields, covariant differentiation, Lie differentiation, differential forms, Frobenius' theorem, Stokes' theorem, flows of vector fields.

Prerequisite(s): Pure Mathematics 445 or 545; and one of Mathematics 375 or Applied Mathematics 311 or 307.

Applied Mathematics 507 3 units; H(3-0)

Introduction to Relativity Theory
Mathematical theories of space and time. Special Relativity. Electro-dynamics. General Relativity.

Prerequisite(s): Applied Mathematics 505.

Applied Mathematics 509 3 units; H(3-0)

Analytical Dynamics
Symplectic geometry, Hamilton's equation, Hamilton-Jacobi theory, constraints and reduction.

Prerequisite(s): Applied Mathematics 505.

Applied Mathematics 581 3 units; H(3-0)

Stochastic Calculus for Finance
Martingales in discrete and continuous time, risk-neutral valuations, discrete- and continuous-time (B,S)-security markets, Cox-Ross-Rubinstein formula, Wiener and Poisson processes, Ito formula, stochastic differential equations, Girsanov's theorem, Black-Scholes and Merton formulas, stopping times and American options, stochastic interest rates and their derivatives, energy and commodity models and derivatives, value-at-risk and risk management.

Prerequisite(s): Applied Mathematics 481.

Antirequisite(s): Credit for Applied Mathematics 581 and 681 will not be allowed.

Applied Mathematics 583 3 units; H(3-0)

Computational Finance
Review of financial asset price and option valuation models; model calibration; tree-based methods; finite-difference methods; Monte Carlo simulation; Fourier methods.

Prerequisite(s): Applied Mathematics 481 and 491.

Antirequisite(s): Credit for Applied Mathematics 583 and 683 will not be allowed.

Arabic Language and Muslim Cultures ALMC

Instruction offered by members of the Department of Linguistics, Languages and Cultures in the Faculty of Arts.

All students wishing to take Arabic language courses for the first time must consult the Department to be placed in an appropriate course. Native speakers are not eligible to take language courses, but are eligible to take Arabic literature, linguistics and culture courses such as Arabic Language and Muslim Cultures 317, 319, 353, 357 or 359.

Arabic Language and Muslim Cultures 202 3 units; H(4-0)

Beginners Arabic I
A comprehensive course for students with no prior knowledge of the language. Includes training in listening, speaking, reading and writing of Modern Standard Arabic in its cultural context.

Prerequisite(s): Consent of the Department.

Arabic Language and Muslim Cultures 204 3 units; H(4-0)

Beginners Arabic II
Continuation of Arabic Language and Muslim Cultures 202.

Prerequisite(s): Arabic Language and Muslim Cultures 202.

Arabic Language and Muslim Cultures 301 3 units; H(4-0)

Continuing Arabic I
A comprehensive course that includes further training in listening, speaking, reading and writing Modern Standard Arabic in its cultural context. Development of increased sophistication in language production and cultural understanding.

Prerequisite(s): Arabic Language and Muslim Cultures 204.

Arabic Language and Muslim Cultures 303 3 units; H(4-0)

Continuing Arabic II
A continuation of Arabic Language and Muslim Cultures 301.

Prerequisite(s): Arabic Language and Muslim Cultures 301.

Arabic Language and Muslim Cultures 313 3 units; H(4-0) (formerly Arabic Language and Muslim Cultures 213)

Reading Classical Arabic
An introduction to Arabic grammar and syntax through readings of classical sources.

Prerequisite(s): Arabic Language and Muslim Cultures 204.

Arabic Language and Muslim Cultures 317 3 units; H(3-0)

Muslim Civilization I
Comparative study of Muslim civilization from Africa, the Arab and Persianate world, Asia and the West up to the end of the 18th century.

Note: Taught in English.

Arabic Language and Muslim Cultures 319 3 units; H(3-0)

Muslim Civilization II
Comparative study of Muslim civilization from Africa, the Arab and Persianate world, Asia, and the West focusing on the developments of the 19th, 20th and 21st centuries.

Note: Taught in English.

Arabic Language and Muslim Cultures 331 3 units; H(3-0)

Intermediate Arabic I
A comprehensive course that increases the command of the structure of modern standard Arabic through reading materials; develops reading and writing skills and comprehension. Development of increased sophistication in language production and cultural understanding.

Prerequisite(s): Arabic Language and Muslim Cultures 303.

Arabic Language and Muslim Cultures 333 3 units; H(3-0)

Intermediate Arabic II
A continuation of Arabic Language and Muslim Cultures 331.

Prerequisite(s): Arabic Language and Muslim Cultures 331.

Arabic Language and Muslim Cultures 343 3 units; H(4-0)

Colloquial Spoken Arabic
Introduction to the everyday spoken language used in Arabic-speaking countries.

343.01. Egyptian

343.02. Levantine

343.03. Gulf Varieties

Prerequisite(s): Arabic Language and Muslim Cultures 204.

Arabic Language and Muslim Cultures 353 **3 units; H(3-0)**

Arabic Language and Linguistics
Provides an understanding of what is meant by 'Arabic,' both as a language and a language system by developing a structural understanding of Arabic through the introduction of linguistic concepts and topics.

Prerequisite(s): Arabic Language and Muslim Cultures 204.

Note: Taught in English.

Arabic Language and Muslim Cultures 357 **3 units; H(3-3)**

Cinema of Muslim Societies
Exploration of the diversity of national and regional cinemas in predominantly Muslim societies of the world.

Note: Taught in English.

Arabic Language and Muslim Cultures 359 **3 units; H(3-0)**

Literature of Muslim Societies
Study of literary texts within the context of the rich, diverse traditions and cultures of predominantly Muslim societies of the world.

Note: Taught in English.

Archaeology ARKY

Instruction offered by members of the Department of Anthropology and Archaeology in the Faculty of Arts.

Junior Courses

Archaeology 201 **3 units; H(3-3)**

Introduction to Archaeology
Basic principles of archaeology. How archaeological remains are located, recovered and interpreted.

Archaeology 203 **3 units; H(3-2)**

An Introduction to Physical Anthropology
Survey of the major subfields of physical anthropology including evolution, human paleontology, genetics, osteology and variation, and techniques of data collection.

Archaeology 205 **3 units; H(3-0)**

Ancient Peoples and Places
An overview of Old and New World archaeology; the emergence of humans; development of humans and culture from hunting/gathering to agricultural and ancient urban societies.

Senior Courses

Archaeology 303 **3 units; H(3-0)**

Archaeology of North America
Prehistoric cultural developments in North America.

Archaeology 305 **3 units; H(3-0)**

Human Variation and Adaptation
Some of the major problems involved in interpreting modern and recent human diversity. Emphasis is placed on the interaction between human cultural and biological systems and on cultural influences upon human biological diversity. Factors important to archaeological interpretation will be stressed.

Prerequisite(s): Mathematics 30-1, 30-2 or Pure Mathematics 30; and one of Archaeology 203 or Biology 241 or 205.

Archaeology 306 **6 units; F(0-7)**

Field Course in Archaeological Techniques
Practical application of modern field techniques in archaeology, including excavation, recording and analysis of sites, artifacts and related materials. (Advanced students are referred to Archaeology 506.)

Prerequisite(s): Consent of the Department.

Note: Normally offered during the Spring and/or Summer Intersession.

Archaeology 307 **3 units; H(3-0)**

Introduction to Ethnoarchaeology
Theory, method, ethics and the contributions of ethnoarchaeological research to archaeology and other disciplines are explored using worldwide examples.

Archaeology 317 **3 units; H(3-0)**

Archaeology of the Ancient Puebloan Southwest
Survey of the Puebloan archaeology of southwestern North America and their pre-Puebloan ancestors. Topics include changes in hunter-gatherer mobility and economy, the rise of agriculture in the American Southwest, the rise of integrative communities and religious belief systems, as well as responses to violence, disease, climate change, and the immigration of non-Puebloan outsiders.

Antirequisite(s): Credit for Archaeology 317 and 427 will not be allowed.

Archaeology 321 **3 units; H(3-0)**

Mammoths to Maize, Medicine Wheels and Warriors: Archaeology of the Canadian Plains
Introduction to Canadian Plains archaeology. Processes of cultural and social change on the northern plains over the last 12,000 years from early hunters of Ice–Age megafauna to tribal level farming societies are explored from a Canadian Plains perspective.

Antirequisite(s): Credit for Archaeology 321 and 421 will not be allowed.

Archaeology 325 **3 units; H(3-0)**

Ancient Civilizations
The rise and achievements of the earliest civilizations in both the Old and New Worlds. Emphasis will be placed on the civilizations of Mesopotamia, Egypt, India, China, Mesoamerica and the Andes.

Archaeology 327 **3 units; H(3-0)**

Archaeology and Popular Culture
Archaeology is examined in terms of its place in contemporary society. Topics may include the use of archaeological evidence by special interest groups; archaeology as viewed by the media; ethical questions relating to the practice of archaeology.

MAY BE REPEATED FOR CREDIT

Archaeology 329 **3 units; H(3-0)**

Fringe Archaeology
Explores popular, fantastic and alternate interpretations of archaeological remains presented in the press and popular media and analyzes the logical flaws in pseudoscientific explanations. Students hone their critical thinking skills and discover the "real story" about our past revealed by the science of archaeology.

Antirequisite(s): Credit for Archaeology 329 and 327.01 will not be allowed.

Archaeology 331 **3 units; H(3-0)**

Archaeology and the Media
Explores how the ancient world, human evolution, archaeologists, and archaeology are represented in a range of media (e.g. films, books, video games, websites, newspapers). Examines how archaeologists use digital media and social media sites to conduct research, as well as disseminate information to indigenous communities and the general public.

Antirequisite(s): Credit for Archaeology 331 and 327.02 will not be allowed.

Archaeology 333 **3 units; H(3-0)**

Becoming Human
An introduction to human biological and cultural evolution. Brings together Paleolithic, archaeological, biological, geological and Paleoecological evidence to provide a holistic overview of the path to humanity.

Antirequisite(s): Credit for Archaeology 333 and 327.03 will not be allowed.

Archaeology 335 **3 units; H(3-0)**

African Stone Age
Introduction to the African Stone Age, with emphasis on sub-Saharan Africa. Major cultural developments are explored through archaeological data, as well as other disciplines, including biogeography and geoarchaeology. Topics include early human origins and the behaviour of early humans during the middle Pleistocene, as well as the Later Stone Age. Focus on major chronological events and the cultural processes that characterize the Paleolithic era on the continent.

Antirequisite(s): Credit for Archaeology 335 and 435 will not be allowed.

Archaeology 341 **3 units; H(3-0)**

Ancient Mexico
Ancient cultures of Mexico, excluding the Maya, from their beginnings to the historic period. Emphasis on the civilizations of the Olmecs, Zapotecs, Teotihuacanos, Toltecs and Aztecs.

Archaeology 343 **3 units; H(3-0)**

The Ancient Maya
Ancient Maya, from their beginnings to the historic period. Emphasis on the Classic Maya civilization, from AD 200-900.

Archaeology 345 **3 units; H(3-0)**

The Legacy of Mesoamerica
Traditional native cultures of Middle America. Emphasis is on technology, social organization, economic systems, religions, arts and languages, particularly in the culture centres of Mexico.

Archaeology 347 **3 units; H(3-0)**

Regional Studies in Latin American Archaeology
A general survey of the archaeology of the region and an intensive look at the archaeology of the immediate vicinity, including visits to sites and museums. Content varies according to region in Latin America where course is taught. Individual and group study are interspersed with formal instruction.

Prerequisite(s): Consent of the Department.

Note: This course is offered only during Spring and/or Summer Intersession.

Archaeology 351 **3 units; H(3-0)**

Archaeology of South America: The Lowlands and the Northern Andes

Prehistoric cultural development in the tropical areas of South America with particular emphasis on the Amazon Basin.

Prerequisite(s): Archaeology 201 or 205.

Archaeology 353 **3 units; H(3-0)**

Archaeology of South America: The Central Andes

The rise of civilization in the Peruvian and Bolivian Andes. Beginning with the first hunting cultures before 8000 B.C., this course reviews the major events and cultural processes which ultimately led to the development of the Inca civilization.

Prerequisite(s): Archaeology 201 or 205.

Archaeology 355 **3 units; H(3-0)**

Native Cultures of the Amazon

A survey of the culture and linguistics of aboriginal South America, with emphasis on the lowland regions.

Archaeology 357 **3 units; H(3-0)**

The Incas and Their Successors

Traditional cultures of the Ecuadorian, Peruvian and Bolivian Andes. Special emphasis is placed on the social, political and economic organizations of the Inca empire.

Archaeology 395 **3 units; H(3-0)**

African Archaeology

African archaeology from the earliest times to the ethnographic present, particularly on Holocene cultures, including hunters and foragers, sedentary farmers, and urban societies.

Prerequisite(s): Archaeology 201 or 205.

Archaeology 399 **3 units; H(3-0)**

Ethnohistory of Africa

Examples of African ethnohistory are explored using the techniques found in African historical archaeology including oral history and traditions, ethnoarchaeology, genetics, archaeology, historical records and art history.

Archaeology 401 **3 units; H(3-0)**

Archaeology of the Near East

Survey of the prehistory of the Near East, starting with the earliest traces of human activity up to the Bronze Age. Topics include adaptations to a varied environment, successive human migrations out of Africa, the nature of the Middle-Upper Palaeolithic transition, the agricultural revolution, and the world's earliest cities and states.

Prerequisite(s): Archaeology 201 or 205.

Archaeology 411 **3 units; H(3-0)**
(formerly Archaeology 511)

Mesoamerican Writing Systems

Overview of Mesoamerican writing systems, including Maya hieroglyphics. Topics include the origin and development of writing in Mesoamerica, as well as the evolution of the calendar and other notational systems. Introduction to methods of decipherment and current interpretations of the texts.

Prerequisite(s): Archaeology 341 and 343.

Archaeology 413 **3 units; H(3-2)**
(Geography 413)

Soil Characteristics and Formation

Characteristics of soils and the processes and factors of soil formation. Soil development related to geomorphic materials, geomorphic events, anthropogenic sources, and erosional and depositional landscapes.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 and Geography 313.

Archaeology 415 **3 units; H(3-3)**

Lithic Technology

Study and analysis of tools and other artifacts, including their forms, methods of manufacture and use.

Prerequisite(s): Archaeology 201.

Note: Preference in enrolment is given to students who have declared a Major in Archaeology.

Archaeology 417 **3 units; H(3-3)**

Zooarchaeology

The study and analysis of osteological remains used in reconstructing the subsistence strategies of past peoples.

Prerequisite(s): Archaeology 201.

Note: Preference in enrolment is given to students who have declared a Major in Archaeology.

Archaeology 419 **3 units; H(3-0)**

Tipi, Buffalo, and Vision: People of the Plains

From the Blackfoot in the North to the Apache in the south, the lifeways of Plains people were incredibly diverse, including the iconic buffalo hunting people of the western Plains as well as the horticultural people of the eastern Plains. Explores traditional Plains culture as recorded in anthropological ethnographies, early European written accounts, and First Nations oral traditions.

Antirequisite(s): Credit for Archaeology 419 and Anthropology 419 will not be allowed.

Archaeology 423 **3 units; H(3-0)**

Archaeology of the Arctic

Prehistory/history of N. E. Asia, Alaska, Canada and Greenland. Emphasis will be placed on ecological and ethnographical data.

Prerequisite(s): Archaeology 201 or 205 or 303.

Archaeology 437 **3 units; H(3-0)**

Paleolithic Archaeology in the Old World

A global survey of Old World prehistoric hunter-gatherers with an emphasis on factual data, analytical techniques, and interpretive trends in the study of the Paleolithic era.

Prerequisite(s): Archaeology 201 or 203.

Antirequisite(s): Credit for Archaeology 437 and 533.14 will not be allowed.

Archaeology 439 **3 units; H(3-0)**

African Complex Societies

Ancient African complex societies with an emphasis on state development south of the Sahara. Topics include why these states developed, their participation in internal and international systems of exchange, technological developments, belief systems that supported power structures, and the reasons for their collapse. Time period covered is from the rise of the ancient state of Egypt to the colonial period.

Prerequisite(s): Archaeology 201.

Archaeology 443 **3 units; H(3-0)**

Hunter-Gatherer Archaeology

An overview of the history of hunter-gatherer studies in anthropology and archaeology. Introduces current theoretical issues in hunter-gatherer research.

Prerequisite(s): Archaeology 201.

Antirequisite(s): Credit for Archaeology 443 and 531.81 will not be allowed.

Archaeology 451 **3 units; H(3-0)**

Introduction to Method and Theory

A survey of contemporary approaches to the study of archaeology emphasizing concepts from other disciplines.

Prerequisite(s): Archaeology 201 and 60 units (10 full-course equivalents).

Archaeology 453 **3 units; H(3-2)**

Fundamentals of Geoarchaeology

Analytical methods used in geoarchaeology. The interpretation of site and regional context, provenance, and paleoenvironment, and the application of dating methods, chemical and isotopic methods, and remote sensing. Case studies and experiential learning through field examples.

Prerequisite(s): Archaeology 201 or Geography 211 or Geology 201 or Geology 209.

Archaeology 455 **3 units; H(3-0)**

Paleoindian Archaeology

Comprehensive overview of early hunter-gatherer archaeology in North and South America, including the Clovis/pre-Clovis debate, theoretical issues surrounding early hunting and mobility, the migration to the Americas during the last ice age, and cultural ecological dynamics.

Prerequisite(s): Archaeology 201.

Archaeology 471 **3 units; H(3-2)**

Ceramic Analysis

The production of pottery: raw materials and techniques. Form, function and decoration. Ceramic ecology. Field processing and sampling. Classification: a survey of approaches. Ceramics and archaeological inference. Practical exercises.

Prerequisite(s): Archaeology 201.

Archaeology 503 **3 units; H(3-0)**

Gender in Prehistory

The theoretical background for feminist archaeology and some of the important advances in Old and New World gender studies. Topics include the relationship of gender hierarchy to the rise of the state; contrasts between the ideological representation of gender and culture practice; and an overarching theme of critical analysis relating the present to the past.

Prerequisite(s): Archaeology 451.

Archaeology 505 **3 units; H(3-0)**

Topics of Debate

Topics of debate in archaeology and human biology from a perspective that emphasizes philosophical, theoretical and methodological issues. Designed to hone students' critical, analytical, and debating skills, and as preparation for graduate studies.

Prerequisite(s): Archaeology 451.

Note: Archaeology 505 should be taken in the final year of the program.

Archaeology 506 **6 units; F(0-7)**

Advanced Archaeological Field Techniques
As a continuation of Archaeology 306, students are offered training in the more advanced aspects of field work.

Prerequisite(s): Archaeology 201 and 306.

Note: Normally offered during the Spring and/or Summer Intersession.

Archaeology 515 **3 units; H(3-3)**

Paleoethnobotany
The study of the uses of plants for food and other purposes such as tools by people in the past through archaeological remains and ethnobotanical research with contemporary people. Macroscopic and microscopic plant remains, such as phytoliths, starch grains, seeds, and charcoal are employed to reconstruct the past environments of ancient people. Theoretical and ethnobotanical issues such as folk taxonomy and ownership of traditional knowledge are explored.

Prerequisite(s): Archaeology 201.

Antirequisite(s): Credit for Archaeology 515 and 533.26 will not be allowed.

Archaeology 521 **3 units; H(3-0)**

Reconstructing Plains Culture
Archaeological plains cultures and the methodological and theoretical issues involved in the use of archaeological reconstructions of the past. Normally, focus will be on the Canadian Plains.

Prerequisite(s): Archaeology 321.

Antirequisite(s): Credit for Archaeology 521 and 623 will not be allowed.

Archaeology 523 **3 units; H(3-0)**
(Anthropology 523)

Human Ecology
Current directions in various subfields of human ecology as they apply to Anthropology, Archaeology, and Geography.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Archaeology 523 and Geography 523 will not be allowed.

Archaeology 531 **3 units; H(3-0)**

Special Topics in Archaeology
This course is offered periodically to meet special needs of students or visiting faculty members.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Archaeology 533 **3 units; H(3-0)**

Special Topics in Analytical Archaeology
This course is offered periodically to meet special needs of students or visiting faculty members.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Archaeology 537 **3 units; H(3-0)**

Topics in Mesoamerican Archaeology
Focus will be on particular time periods or themes in Mesoamerican archaeology and ethnohistory.

Prerequisite(s): Any two of Archaeology 341, 343, 345 or 347.

Archaeology 553 **3 units; H(3-0)**

Caribbean Prehistory
The prehistory and history of the indigenous peoples of the Caribbean from the first peopling of the islands to the early contact period.

Antirequisite(s): Credit for Archaeology 553 and 531.61 will not be allowed.

Archaeology 555 **3 units; H(3-2)**

Human Osteology
Identification and interpretation of human skeletal and dental remains. Emphasis is on functional anatomy and reconstruction of prehistoric lifeways.

Prerequisite(s): Archaeology 203 and admission to the Archaeology or Anthropology major.

Antirequisite(s): Credit for Archaeology 555 and 613 will not be allowed.

Archaeology 589 **3 units; H(3-0)**
(Anthropology 589)

Nutritional Anthropology
The study of human dietary practices from biological and cultural perspectives. Subjects covered include the development of nutritional anthropology, principles of nutrition, principles of ecology, diet from an evolutionary, comparative and historic perspective, the impact of undernutrition on human physiology, and behaviour and methods in nutritional anthropology.

Prerequisite(s): Mathematics 30-1, 30-2, or Pure Mathematics 30; and one of Anthropology 201 or Archaeology 203 or Archaeology 305, and consent of the Department.

Archaeology 591 **3 units; H(3-0)**

Landscape Archaeology
Human perceptions and uses of the ecophysical and cultural environment. How societies humanize their environment by naming places, identifying resources, establishing paths, modifying and replicating the natural landscape thereby creating a tradition of land use that can be accessed archaeologically.

Prerequisite(s): Archaeology 451.

Archaeology 593 **3 units; H(3-0)**

Household Archaeology
Human perceptions and uses of the built environment, particularly residential architecture. The emphasis is on the structure and symbolism associated with the spatial arrangements of objects, activities, and social interactions.

Prerequisite(s): Archaeology 451.

Archaeology 595 **3 units; H(3-0)**

Problems in Palaeopathology and Palaeonutrition
Patterns of disease in prehistoric human populations with consideration to the interaction of health and nutrition. Techniques for determining disease and nutrition from prehistoric remains are covered.

Prerequisite(s): Mathematics 30-1, 30-2 or Pure Mathematics 30; Archaeology 203 and admission to the Archaeology or Anthropology major.

Note: Archaeology 555 is recommended as preparation for this course.

Archaeology 596 **6 units; F(3S-0)**

Honours Thesis (BSc)
Thesis normally required of Honours BSc students and also open for credit to other undergraduate majors. Students are expected to carry out an analytical research project on a subject acceptable to the Department and to produce a final report written in a professional manner. Normally the project will be directed by one staff member who will consult with another staff member in arriving at an evaluation of the report.

Prerequisite(s): Consent of the Department.

Archaeology 597 **3 units; H(3S-0)**

Independent Reading Course
An independent reading course for archaeology Majors. Each student is required to choose reading in consultation with an advisor.

Prerequisite(s): Consent of the Department.

Archaeology 598 **6 units; F(3S-0)**

Honours Thesis (BA)
Thesis normally required of Honours BA students and also open for credit to other undergraduate majors. Students are expected to carry out a research project in a subject acceptable to the Department and to produce a final report written in a professional manner. Normally, the project will be directed by one staff member who will consult with another staff member in arriving at an evaluation of the report.

Prerequisite(s): Consent of the Department.

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Archaeology 601 **3 units; H(3S-0)**

Theoretical Foundations
The philosophy of science, the history of anthropological theory, and a survey of contemporary theoretical approaches in anthropology. Throughout, the relevance to and connections with the subdisciplines of archaeology and biological anthropology will be emphasized.

Prerequisite(s): Consent of the Department.

Archaeology 603 **3 units; H(3S-0)**

Seminar on Special Topics
Intensive study of special problems of particular interest to Archaeology Department graduate students. Subject matter for any particular year to be left to the discretion of the Department.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Archaeology 613 **3 units; H(3-1T-2)**

Analysis of Human Skeletal Remains
Methods of analyzing human remains from archaeological contexts with emphasis on identification and description. Lecture, lab and weekly seminar directed to Archaeology graduate students who have not had a previous course in human osteology.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Archaeology 613 and either 555 or 603.07 will not be allowed.

Archaeology 615 **3 units; H(3S-0)**

Topics in Archaeological Theory and Method
The history of archaeological theory and contemporary theoretical and methodological approaches used in archaeological research.

Prerequisite(s): Consent of the Department.

Archaeology 617 **3 units; H(3S-0)**

Theory and its Application in Biological Anthropology
Basic issues in the study of human adaptation with a focus on principles of evolutionary biology as

they apply to modern studies. Throughout, a bio-cultural approach will be emphasized.

Prerequisite(s): Consent of the Department.

Archaeology 619 **3 units; H(3-0)**

Advanced Topics in Human Osteology
Current developments in interpretation of human skeletal and dental remains. Topics include forensic anthropology, bone biology, and population reconstruction.

Prerequisite(s): Archaeology 555.

Archaeology 621 **3 units; H(3S-0)**

Problems in Ethnoarchaeology
Seminar on selected topics relating to ethnoarchaeology.

Prerequisite(s): Consent of the Department.

Archaeology 625 **3 units; H(3S-0)**

Hunter-Gatherer Adaptations
Intensive study of contemporary and prehistoric hunter-gatherer social and economic adaptations.

Archaeology 627 **3 units; H(3S-0)**

Origins of Agriculture
Intensive study of the origins of agriculture throughout the world.

Archaeology 631 **3 units; H(3S-0)**

The Development of Complex Societies
The rise, development, and collapse of complex societies throughout the world.

Prerequisite(s): Consent of the Department.

Archaeology 633 **3 units; H(3S-3)**

Specialized Analyses of Archaeological Materials
Theory and practice for specialized analyses of the physical and chemical composition of archaeological materials, including microscopic traces of use. Topics will cover procedures used to prepare materials for such specialized analyses and to identify the relevant properties, as well as issues of quantification and interpretation.

Prerequisite(s): Consent of the Department.

Archaeology 635 **3 units; H(3S-0)**

Social Identity
Social identity is a fundamental theoretical and practical concern for archaeologists, physical anthropologists, and paleoanthropologists. Explores how humans use material culture and material practices to interact in a world ordered by social identities. Students will explore how research in their area of interest has addressed social identities.

Prerequisite(s): Consent of the Department.

Archaeology 637 **3 units; H(3S-0)**

Mesoamerican Archaeology and History
Ancient history of Mesoamerica, emphasizing a conjunctive approach based on hieroglyphic, historical and ethnohistorical sources as well as on archaeological evidence.

Prerequisite(s): Consent of the Department.

Archaeology 639 **3 units; H(3S-0)**

Stable Isotope Methods in Archaeology
Methods and applications of stable isotope analysis to archaeological research. Topics to be covered include the use of light stable isotopes to determine past and present diet, the use of stable isotopes to document residence and migration, analysis of stable carbon isotopes in soils, stable isotope ecology for environmental reconstruction and paleoclimate studies.

Prerequisite(s): Consent of the Department.

Archaeology 701 **3 units; H(3S-0)**

Special Topics in World Archaeology
Archaeology of particular geographical areas such as Circumpolar, North America, Mesoamerica, South America, Africa, Oceania, and Europe and Near East.

MAY BE REPEATED FOR CREDIT

Archaeology 703 **3 units; H(3S-0)**

Advanced Seminar in Selected Topics
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Architectural Studies ARST

Offered by the Faculty of Environmental Design.

Junior Course

Architectural Studies 201 **3 units; H(2-1T)**

Introduction to Architectural Studies
An introduction to architecture as an artistic and scientific endeavour as well as an examination of its purpose and intentions, its processes, and its products. Students will develop an understanding of the social, cultural, historical, technological, economic, and natural context influencing the design of buildings and other objects.

Senior Courses

Architectural Studies 423 **3 units; H(3-0)**

Sustainability in the Built Environment
The principle of sustainability recognizes people as temporary stewards of their environments, working toward a respect for natural systems and a higher quality of life. Examination of the built environment and the tools to achieve a stable and balanced and a regenerative ecosystem in a process of responsible consumption, wherein waste is minimized and the built environment interacts with natural environments and cycles. Healthful interior environments, resource efficiency, ecologically benign materials, renewable energies and social justice issues are examined.

Prerequisite(s): Admission to the Architectural Studies Minor or consent of the Faculty.

Antirequisite(s): Credit for Architectural Studies 423 and Environmental Design 523 will not be allowed.

Architectural Studies 444 **6 units; F(0-8)**

Studio II in Architecture
An introduction to the application of ordering principles of architecture and to the numerous layers that contributes to the quality of inhabitation of place and space through design. Issues explored include the formal, the experiential and the theoretical concerns of architectural design in today's cultural context.

Prerequisite(s): Architectural Studies 451 and 484 and admission to the Architectural Studies Minor or consent of the Faculty.

Corequisite(s): Architectural Studies 453.

Antirequisite(s): Credit for Architectural Studies 444 and Environmental Design Architecture 582 will not be allowed.

Architectural Studies 449 **3 units; H(3-0)**

Building Science and Technology I
Functioning of the building enclosure: demonstration of the behaviour of building elements and their sub-assemblies under differential temperature and pressure stresses; fundamentals of acoustics; nature and use of building materials; response of building materials to climatic cycles radiation, precipitation, heating and cooling.

Prerequisite(s): Admission to the Architectural Studies Minor or consent of the Faculty.

Antirequisite(s): Credit for Architectural Studies 449 and Environmental Design Architecture 511 will not be allowed.

Architectural Studies 451 **3 units; H(0-8)**

Graphics Workshop I
A skill building course with instruction and supervised experience in basic drafting, sketching and rendering; principles of perspective, drawing and presentation conventions. A variety of instruction may be offered to accommodate the varied level of student development.

Prerequisite(s): Admission to the Architectural Studies Minor or consent of the Faculty.

Corequisite(s): Architectural Studies 484.

Antirequisite(s): Credit for Architectural Studies 451 and Environmental Design Architecture 541 will not be allowed.

Architectural Studies 453 **3 units; H(0-8)**

Graphics Workshop II
Instruction and supervised experience in drafting, sketching and rendering; drawing and presentation conventions. Builds on Architectural Studies 451. A variety of instruction may be offered to accommodate the varied level of student development.

Prerequisite(s): Architectural Studies 451 and 484 and admission to the Architectural Studies Minor or consent of the Faculty.

Corequisite(s): Architectural Studies 444.

Antirequisite(s): Credit for Architectural Studies 453 and Environmental Design Architecture 543 will not be allowed.

Architectural Studies 457 **3 units; H(3-0)**

History of Architecture and Human Settlements
A survey history of architecture and human settlement from the prehistoric world until the present. The first course addresses the pre-modern traditions of the major world cultures. The second course explores the traditions of the Western world from the beginning of the Italian Renaissance until the present. The courses will examine the changes in world view that have altered the course of architecture through the study of selected works of architecture and urbanism.

457.01. History of Architecture and Human Settlements I-Premodern Traditions of the World

457.02. History of Architecture and Human Settlements II-The Rise of Modernity, 1750 to the Present

Prerequisite(s): Admission to the Architectural Studies Minor or consent of the Faculty.

Antirequisite(s): Credit for Architectural Studies 457 and Environmental Design Architecture 523 will not be allowed.

Architectural Studies 483 **3 units; H(3-0)**

Interdisciplinary Seminar
Conceptual frameworks in Environmental Design and theories related to design and environment

that influence environmental design thinking and practice.

Prerequisite(s): Admission to the Architectural Studies Minor or consent of the Faculty.

Antirequisite(s): Credit for Architectural Studies 483 and Environmental Design 601 will not be allowed.

Architectural Studies 484 **6 units; F(0-8)**

Studio I - Design Thinking
Foundation concepts in design and form making involving a sequence of progress skill building, visual and spatial thinking and problem solving exercises.

Prerequisite(s): Admission to the Architectural Studies Minor or consent of the Faculty.

Corequisite(s): Architectural Studies 451.

Antirequisite(s): Credit for Architectural Studies 484 and either Architectural Studies 485 or Environmental Design Architecture 580 will not be allowed.

Art ART

Instruction offered by members of the Department of Art in the Faculty of Arts.

Junior Courses

Art 205 **3 units; H(3-3)**

Introduction to the Foundations of Art Education
An introduction to the history, theory and philosophy of art education through participatory learning events.

Prerequisite(s): Admission into a degree program offered by the Department of Art.

Art 231 **3 units; H(3-3)**

Art Fundamentals: 2D
Two-dimensional activities and the structural, organizational, perceptual, social and psychological aspects of art.

Art 233 **3 units; H(3-3)**

Art Fundamentals: 3D
Three-dimensional activities and the structural, organizational, perceptual, social and psychological aspects of art.

Art 235 **3 units; H(3-3)**

Introduction to Photography
An introductory course in current photographic methods, including digital photography, digital image processing and printing, and the presentation of photographs.

Antirequisite(s): Credit for Art 235 and 335 will not be allowed.

Note: Students must provide their own digital single lens reflex camera for the duration of the term. Please consult with the department for more information.

Art 241 **3 units; H(3-3)**

Drawing I
Basic theory and practice of drawing, involving mainly still life and figure projects in monochromatic media.

Art 243 **3 units; H(3-3)**

Drawing II
Continuation of Art 241, introducing colour media.

Prerequisite(s): Art 241.

Art 251 **3 units; H(3-3)**

Media Arts: Practice and Theory I
Technical instruction and creative opportunities in the media arts, in addition to examination of historical, theoretical and critical context.

Art 253 **3 units; H(3-3)**

Media Arts: Practice and Theory II
Continued technical instruction and creative opportunities in the media arts, in addition to examination of historical, theoretical and critical context.

Prerequisite(s): Art 251.

Art 271 **3 units; H(3-3)**

Introduction to Printmaking
Basic concepts and techniques in Fine Art Printmaking.

Senior Courses

Art 301 **3 units; H(3-0)**

Studies in Contemporary Canadian Art
Study of recent Canadian art from a range of perspectives in art criticism.

Art 305 **3 units; H(3-3)**

Applied Concepts in Early Childhood Art
Theory and methods of creating meaningful art experiences for young children (ages 3-8), with a practical component.

Prerequisite(s): Art 205, 231 and 233.

Antirequisite(s): Credit for Art 305 and 211 will not be allowed.

Art 307 **3 units; H(3-3)**

Applied Concepts in Art with Children
Theory and methods of creating meaningful art experiences for children aged 6 to 12, with a practical component.

Prerequisite(s): Art 205, 231 and 233.

Art 311 **3 units; H(3-0)**

Topics in Art
Topics in art may include art appreciation, art and everyday life, and themes in art history.

MAY BE REPEATED FOR CREDIT

Art 313 **3 units; H(3-3)**

Video Art
Focuses on concepts, issues, and techniques of video as an art medium. Students will gain experience and a working knowledge of concept development, video shooting and digital editing, in the context of contemporary art theory and practice.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Art.

Note: Students must provide their own digital video camera for the duration of the term.

Art 315 **3 units; H(3-3)**

Programming for Artists
An introduction to computer programming techniques used to create interactive art projects.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Art.

Antirequisite(s): Credit for Art 315 and any of Computer Science 217, Computer Science 231, Computer Science 235 or Engineering 233 will not be allowed.

Art 317 **3 units; H(3-3)**
(formerly Art 439)

Electronics for Artists
Theoretical and practical applications of basic electronic principles and techniques involving the use of electronics in contemporary art practices. Will include applied experiences with hardware and visual programming environments.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Art.

Art 321 **3 units; H(3-0)**

Net Art: Theory and Practice
Examination of the work of Net-based artists and investigation of the Internet as a vehicle to extend art and design practice.

Art 327 **1.5 units; Q(0-2)**

Art Now I
A series of presentations by visiting artists and scholars that introduces students to professional practices of contemporary visual artists.

Prerequisite(s): 6 units (1.0 full-course equivalent) in courses labelled Art at the 200 level.

Art 329 **1.5 units; Q(0-2)**

Art Now II
A continuation of Art 327: Art Now I, a series of presentations by visiting artists and scholars that introduces students to professional practices of contemporary visual artists.

Prerequisite(s): 6 units (1.0 full-course equivalent) in courses labelled Art at the 200 level.

Art 331 **3 units; H(3-3)**

2D Digital Imaging
Electronic visualization involving computer applications in artistic practice.

Prerequisite(s): Art 251.

Art 334 **3 units; H(3-3)**
(formerly Art 333)

Time-Based Art
Exploration of time and duration as a component of artistic practice, that may include the use of frame-based media such as time-lapse photography, stroboscopy, stop-motion, and camera-less animation.

Prerequisite(s): Art 251.

Art 336 **3 units; H(3-3)**

Digital Photography
Fundamental technical and aesthetic considerations in the use of the still digital single lens reflex (DSLR) camera and basic use of the microcomputer in support of digital image processing in art.

Prerequisite(s): Art 235.

Antirequisite(s): Credit for Art 336 and 337 will not be allowed.

Note: Students must provide their own digital single lens reflex camera for the duration of the term.

Art 338 **3 units; H(3-3)**

Film Photography
Further work in photography, using film and silver-based photographic materials including intensive use of the variables of exposure, film development and silver-based printing of photographic materials.

Prerequisite(s): Art 235.

Antirequisite(s): Credit for Art 338 and 335 will not be allowed.

Art 339 **3 units; H(3-3)**

Applied Colour Theory
Investigations into the concepts and practices which have supported theories of colour in the visual arts.

Art 341 **3 units; H(3-3)**

Drawing III
Theory and practice of drawing at an intermediate level involving an extended range of drawing media.

Prerequisite(s): Art 243.

Art 343 **3 units; H(3-3)**

Drawing IV
Continuation of Art 341 extending the range of concepts and practices.

Prerequisite(s): Art 341.

Art 345 **3 units; H(3-3)**

Anatomical Drawing I
Perceptual and drawing skills pertaining to human anatomical relationships.

Prerequisite(s): Art 243.

Art 347 **3 units; H(3-3)**

Anatomical Drawing II
Continuation of Art 345. Further study and work in anatomical drawing.

Prerequisite(s): Art 345.

Art 349 **3 units; H(3-3)**

Drawing for the Biological Sciences
Basic and more complex principles of drawing from subjects pertaining to the biological sciences; drawing from observation, exploration of foundational skills in a cross-disciplinary context.

Note: Cannot be used a prerequisite for other Art courses

Art 351 **3 units; H(3-3)**

Painting I
Painting on a two-dimensional surface; the use of oils and acrylics.

Prerequisite(s): Art 243.

Art 353 **3 units; H(3-3)**

Painting II
Further study and work in painting.

Prerequisite(s): Art 351.

Art 361 **3 units; H(3-0)**

Visual Research Methods
Students utilize arts-based research methods to formulate and develop an independent project proposal. In most terms projects will be carried out in digital photography.

Prerequisite(s): 6 units (1.0 full-course equivalent) in courses labelled Art at the 300 level.

Art 363 **3 units; H(3-0)**

Advanced Visual Research Methods
Students pursue individually designed arts-based research projects, examine approaches to editing, sequencing, and presenting projects to an audience. Projects normally will be completed using digital photography.

Prerequisite(s): Art 361.

Art 365 **3 units; H(3-3)**

Topics in Studio Research
A studio-based topics course that introduces students to contemporary and emerging creative practices. Possible topics may include: installation art, performance art, slip casting, etc.

Art 365.01 Performance Art

Prerequisite(s): 6 units (1.0 full-course equivalent) in courses labelled Art at the 300 level.

Art 373 **3 units; H(3-3)**

Printmaking, Lithography I
Basic concepts and techniques of lithographic printing.

Art 377 **3 units; H(3-3)**

Printmaking, Serigraphy I
Basic concepts and techniques of silk-screen printing.

Art 379 **3 units; H(3-3)**

Printmaking, Relief and Intaglio
Basic concepts and techniques in relief and intaglio printmaking.

Art 381 **3 units; H(3-3)**

Sculpture I
Development and realization of sculpture with various techniques and materials.

Prerequisite(s): Art 233.

Art 383 **3 units; H(3-3)**

Sculpture II
Further study and work in sculpture.

Prerequisite(s): Art 381.

Art 393 **3 units; H(3-3)**

Applied Concepts in Art with Adolescents
Development of teaching rationales and strategies for students aged 12 to 18 with a practical component.

Prerequisite(s): Art 205, 231 and 233.

Antirequisite(s): Credit for Art 393 and 390 will not be allowed.

Art 399 **3 units; H(3-0)**

Art in Theory and Practice I
Theories of art, critical methodologies, and aesthetics in the visual arts.

Art 401 **3 units; H(3-0)**

Studies in Contemporary International Art
Study of recent international art practices from a range of perspectives in art criticism.

Art 405 **3 units; H(3-3)**

Mechatronic Art and Design
Focus on the development and production of physical systems-based artwork that incorporate elements of robotics, motion control, software and hardware design. An introduction to electronic devices for use in artmaking, providing practical experience with sensors, motors, switches, gears, lights, simple circuits and computers to create kinetic and interactive works of art.

Prerequisite(s): Art 251 and 315.

Art 411 **3 units; H(3-0)**

Selected Topics in Art Education
Possible topics include, but are not limited to: Multiculturalism and Art Education, Creativity and Art Education, Developmental Issues in Art Education, Art Education with Special Needs Learners.

Prerequisite(s): Art 205 and one of 305, 307 or 393.

MAY BE REPEATED FOR CREDIT

Art 431 **3 units; H(3-3)**

3D Digital Imaging
Creative research in 3D digital visualization and fabrication involving multimedia software and hardware. May include 3D printing, rapid prototyping, laser cutting, and computer controlled milling.

Prerequisite(s): Art 251.

Art 435 **3 units; H(3-3)**

Intermediate Photography I
Investigation of technical and conceptual aspects of contemporary art photography; individual and group study that may include work in film, digital printing and digital photography.

Prerequisite(s): One of Art 335, 336, 337, or 338.

Art 437 **3 units; H(3-3)**

Intermediate Photography II
Continuing work in photography, with emphasis on hand-coated printing media.

Prerequisite(s): Art 435.

Art 441 **3 units; H(3-3)**

Drawing V
Drawing at an intermediate level with an increased emphasis on individual initiative and contemporary concepts in defining objectives.

Prerequisite(s): Art 343.

Art 443 **3 units; H(3-3)**

Drawing VI
Continuation of Art 441.

Prerequisite(s): Art 441.

Art 451 **3 units; H(3-3)**

Painting III
Intermediate work in painting intended to increase ability to deal with painting concepts through appropriate media-technical means.

Prerequisite(s): Art 353.

Art 453 **3 units; H(3-3)**

Painting IV
Continuation of Art 451.

Prerequisite(s): Art 451.

Art 461 **3 units; H(3-3)**

Advanced Studio I
Directed studio research and production for students planning to prepare a portfolio for application to the BFA Honours Visual Studies.

Prerequisite(s): Consent of Department.

Art 465 **3 units; H(3-3)**

Advanced Topics in Studio Research
A studio-based topics course that provides students with an opportunity for advanced exploration of contemporary and emerging creative research practices. Topics may include visiting artist, figure painting, visual research, etc.

Prerequisite(s): 6 units (1.0 full-course equivalent) in courses labelled Art at the 300 level.

MAY BE REPEATED FOR CREDIT

Art 471 **3 units; H(3-3)**

Intermediate Printmaking: Technique
Intermediate work in printmaking with an emphasis on technique and a concentration in one of the four (relief, etching, silkscreen, lithography) print media.

Prerequisite(s): One of Art 373, 377 or 379.

Art 473 **3 units; H(3-3)**

Intermediate Printmaking: Colour
Intermediate work in printmaking with an emphasis on colour and a concentration in one of the four (relief, etching, silkscreen, lithography) print media.

Prerequisite(s): One of Art 373, 377 or 379.

Art 481 **3 units; H(3-3)**

Sculpture III
Problems of three-dimensional form in a variety of materials and techniques.

Prerequisite(s): Art 383.

Art 483 **3 units; H(3-3)**

Sculpture IV
Continuation of Art 481.

Prerequisite(s): Art 481.

Art 491 **3 units; H(2-1)**

Community-Based Art Experiences I
A seminar and field experience course introducing prospective educators to all facets of planning and implementing positive art experiences in a non-school setting.

Prerequisite(s): One of Art 305, 307 or 393.

Art 499 **3 units; H(3-0)**

Art in Theory and Practice II
Examination and discussion of theoretical issues associated with current practice in art.

Prerequisite(s): Art 399 and admission to the BFA or BFA Honours in Visual Studies.

Art 501 **3 units; H(3-0)**

Selected Topics in Media Arts
Possible topics include, but are not limited to: Advance Digital Imaging, Sound and Interactivity, Immersive Art, Tele-Arts.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Art 501 and either Fine Arts 507.08 or 507.09 will not be allowed when the topic is Tele-Arts.

MAY BE REPEATED FOR CREDIT

Art 503 **3 units; H(3-0)**

Computer Game Design
The game design process will be explored, including a history of video games, genres, game mechanics, design documents, and a summary of the development process. The focus will be on design, rather than development, and the artistic and creative assets, rather than the software. Students will design a game and will create a playable prototype. The principles will be applicable to other sorts of games, and to media art in general.

Prerequisite(s): Art 251.

Antirequisite(s): Credit for Art 503 and either Fine Arts 507.06 or 507.07 will not be allowed.

Art 509 **3 units; H(3-0)**

Curriculum Building for Art
Analysis and development of curriculum structure based on current theory with a field research component.

Prerequisite(s): Art 205 and 6 units (1.0 full-course equivalent) in courses labelled Art.

Art 513 **3 units; H(1T-6)**

Directed Study
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Art 515 **3 units; H(3S-0)**

Designing Programs for Art
A seminar course devoted to the analysis and design of program structures derived from current theory with a field research component.

Prerequisite(s): Art 509.

Art 535 **3 units; H(3-3)**

Advanced Photography I
Photography for advanced students taking individual directions with special attention to the interrelation of technique and aesthetics.

Prerequisite(s): Art 437.

Art 537 **3 units; H(3-3)**

Advanced Photography II
Photography for advanced students taking individual directions in black and white and colour photography, with emphasis on the presentation of groups of photographs of related theme or technique.

Prerequisite(s): Art 535.

Art 543 **3 units; H(3-3)**

Drawing VII
Drawing for advanced students taking individual directions.

Prerequisite(s): Art 443.

Art 551 **3 units; H(3-3)**

Painting V
Painting for advanced students taking individual directions.

Prerequisite(s): Art 453.

Art 553 **3 units; H(3-3)**

Painting VI
Painting for advanced students taking individual directions.

Prerequisite(s): Art 551.

Art 560 **6 units; F(2T-4)**

Honours Thesis
Independent studio research and production supported by a research paper for BFA Honours Visual Studies students, culminating in a Thesis Exhibition.

Prerequisite(s): Art 461 and admission to the BFA Honours Visual Studies Program.

Note: Normally completed concurrently with Art 561 and 563.

Art 561 **3 units; H(3-3)**

Advanced Studio II
Directed studio research and production.

Prerequisite(s): Art 461.

Art 563 **3 units; H(3-3)**

Advanced Studio III
Further directed studio research and production.

Prerequisite(s): Art 561.

Art 571 **3 units; H(3-3)**

Advanced Printmaking: Technique
Printmaking for advanced students taking individual directions with emphasis on technique.

Prerequisite(s): Art 471 or 473.

Art 573 **3 units; H(3-3)**

Advanced Printmaking: Colour
Printmaking for advanced students taking individual directions with emphasis on colour.

Prerequisite(s): Art 471 or 473.

Art 583 **3 units; H(3-3)**

Sculpture V
Sculpture for advanced students taking individual directions. Workshop facilities are available for work in plastics, metal, wood, stone, clay and related materials.

Prerequisite(s): Art 483.

Art 591 **3 units; H(2-1)**

Community-Based Art Experiences II
A seminar and field experience course in which students take increased individual responsibility for implementation of educational strategies in diverse field settings.

Prerequisite(s): Art 491.

Art 595 **3 units; H(1T-6)**

Studio Research
Independent studio research.

Prerequisite(s): Consent of the Department.

Corequisite(s): Art 561 or 563.

MAY BE REPEATED FOR CREDIT

Art 599 **3 units; H(3-0)**

Professional Aspects of Art
Examination and discussion of the issues associated with the professional aspects of surviving as an artist. Presentations by professional artists practicing in the field will form a major component of the course.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Art at the 400 level and admission to the BFA or BFA Honours in Visual Studies.

Graduate Courses

Art 601 **3 units; H(0-3T)**

History of Art I
Individual study: in consultation with the instructor, the student will select a research topic in art history or art criticism.

Prerequisite(s): Restricted to MFA or PhD students enrolled in the Art Department.

Art 603 **3 units; H(0-3T)**

History of Art II
Individual study: in consultation with the instructor, the student will select a research topic in art history or art criticism.

Prerequisite(s): Art 601.

Art 605 **3 units; H(0-3T)**

Critical Study and Research
Individual study and research in the area of studio specialization, critical theory, methodological issues and/or historical topics.

Prerequisite(s): Restricted to MFA or PhD students enrolled in the Art Department.

MAY BE REPEATED FOR CREDIT

Art 661 **6 units; F(3/2S-10)**

Advanced Studio Practice
Individual weekly study in studio, with seminar-based discussions in research area. The seminar meets every two weeks throughout the entire academic year.

661.01. Advanced Studio Practice

661.02. Thesis Studio Practice

Prerequisite(s): For Art 661.01: Restricted to MFA or PhD students enrolled in the Art Department. For Art 661.02, the prerequisite is Art 661.01.

Art 691 **3 units; H(3-0)**

Pedagogy and Professional Practice
Issues in professional practice and post-secondary teaching in visual art. Optional course.

Prerequisite(s): Restricted to MFA or PhD students enrolled in the Art Department.

MAY BE REPEATED FOR CREDIT

Art 699 **3 units; H(3-0)**

Topics in Art Theory and Criticism
Studies in contemporary art theory and criticism.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Art 761 **3 units; H(2T-10)**

Advanced Independent Studio research
Theoretical and applied concepts in studio.

Prerequisite(s): Restricted to MFA or PhD students enrolled in the Art Department.

MAY BE REPEATED FOR CREDIT

Art History ARHI

Instruction offered by members of the Department of Art in the Faculty of Arts.

Junior Courses

Art History 201 **3 units; H(3-0)**

Survey of Western Art in its Cultural Context: Pre-history to the Later Middle Ages
A chronological examination of art and architecture in relation to significant historical and cultural events from Pre-history to about 1300 C.E.

Art History 203 **3 units; H(3-0)**

Survey of Western Art in its Cultural Context: Proto-Renaissance to Neo-Classicism
A chronological examination of art and architecture (with some reference to the other arts) in relation to significant historical and cultural events from about 1300 to about 1800.

Art History 209 **3 units; H(3-0)**

Art: World War II to the Present
A chronological examination of Western art in relation to significant historical and cultural events from WWII to the present

Prerequisite(s): Admission to the Visual Studies or Art History major programs.

Senior Courses

Art History 301 **3 units; H(3-0)**

Art of Canada: 1600-1900
Forms and concepts in art in Canada from the Early French and English Colonial periods to 1900.

Prerequisite(s): Art History 201 and 203.

Art History 303 **3 units; H(3-0)**

Art of Canada: 1900 to the Present
Forms and concepts in Canadian art from 1900 to the present; the Group of Seven, Nationalism, Regionalism and more recent developments in Canadian art.

Prerequisite(s): Art History 201 and 203.

Art History 311 **3 units; H(3-0)**

Topics in Art History and Visual Studies
Key concepts and theories within the discipline of Art History. Topics may include: Feminist Art Histories; Themes in Contemporary Art; Art in the Global Context; Biennials and Exhibitions; and Art and Social Critique.

MAY BE REPEATED FOR CREDIT

Art History 323 **3 units; H(3-0)**

Survey of Far Eastern Art: India and Related Civilizations
A chronological examination of the art and architecture of ancient India and related civilizations, with special emphasis on Buddhist, Hindu and Islamic art.

Art History 325 **3 units; H(3-0)**

Survey of Far Eastern Art: China and Related Civilizations
A chronological examination of the art and architecture of ancient China and related civilizations, with special emphasis on Confucian, Taoist and Buddhist art.

Art History 327 **3 units; H(3-0)**

Renaissance Art
A chronological examination of the arts and architecture from the Proto-Renaissance in Italy to the threshold of the High Renaissance (c. 1300-1500). Special attention will be given to the artistic cultures of Florence and Flanders.

Prerequisite(s): Art History 203.

Art History 329 **3 units; H(3-0)**

High Renaissance and Mannerism
A chronological examination of the arts and architecture from about 1500 to the end of the sixteenth century. Special attention will be given to the key artistic personalities representing the High Renaissance and Mannerism in northern and southern Europe.

Prerequisite(s): Art History 203.

Art History 357 **3 units; H(3-0)**

Italian Baroque Art
A chronological examination of the art and architecture during the seventeenth century. Special attention will be given to Rome.

Prerequisite(s): Art History 203.

Art History 359 **3 units; H(3-0)**

Northern Baroque and Rococo Art
A chronological examination of the art and architecture in northern Europe from c. 1600 to 1789.

Prerequisite(s): Art History 203.

Art History 365 **3 units; H(3-0)**

Survey of Far Eastern Art: Japan
A chronological examination of the art and architecture of dynastic Japan, with special emphasis on Shinto and Buddhist traditions.

Art History 367 **3 units; H(3-0)**

Native North American Art in its Cultural Context
Survey of the forms and purposes of Native art in Woodlands, Plains, Northwest Coast and Southwest cultures throughout the prehistoric and historic periods and in conjunction with a study of cultural development and change.

Art History 405 **3 units; H(3-0)**

Late Eighteenth- and Early Nineteenth-Century Art
A chronological examination of European painting and sculpture from the late eighteenth century through the Romantic period.

Prerequisite(s): Art History 203.

Art History 407 **3 units; H(3-0)**

Mid to Late Nineteenth-Century Art
A chronological examination of European painting and sculpture of the Realist, Impressionist and Post-Impressionist periods.

Prerequisite(s): Art History 201 and 203.

Art History 411 **3 units; H(3-0)**

Selected Topics in the History of Art
Topics to be announced. Typical topics include: The Art of Michelangelo, Surrealism, Abstract Art in Canada, Painting in New York from WW II to Present, Art of the West African Sudan, The Canadian Landscape.

411.01. Selected Topics in the History of Art I

411.02. Selected Topics in the History of Art II

Prerequisite(s): 18 units (3.0 full-course equivalents) in Art History.

Art History 415 **3 units; H(3-0)**

Modern Art: From the End of the First World War through the 1950s
Study of the forms and concepts in painting, sculpture, and architecture from the end of the First World War through the 1950s.

Prerequisite(s): Art History 201 and 203.

Art History 419 **3 units; H(3-0)**

Photography in the Nineteenth Century
Origins of photography and its development as technology and art up to 1900.

Art History 423 **3 units; H(3-0)**

Photography in the Twentieth Century
The development of photography from 1900 to the present, with attention to the theory and criticism of photography as an art form.

Art History 425 **3 units; H(3-0)**

Architecture in the Western World Since 1900
A survey of significant examples of modern architecture, defining their stylistic character in light of developments in technology, the history of ideas, and social and historical factors.

Prerequisite(s): Art History 201 and 203.

Antirequisite(s): Credit for Art History 425 and either Environmental Design Architecture 525 or Environmental Design 683.15 will not be allowed.

Art History 501 **3 units; H(0-3T)**

Independent Research in Art History I
Independent research projects for advanced students in art history.

Prerequisite(s): 30 units (5.0 full-course equivalents) in Art History and consent of the Department.

Art History 503 **3 units; H(0-3T)**

Independent Research in Art History II
Continuation of Art 501.

Prerequisite(s): Art History 501.

Art History 511 **3 units; H(3-0)**

Seminar in the History of Art
Topics to be announced. Possible topics include: The Art of Bernini, Cubism, The Group of Seven in Canada.

Prerequisite(s): 24 units (4.0 full-course equivalents) in Art History including 411.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Art History 613 **3 units; H(3-0)**

Independent Study in Art History
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Art History 615 **3 units; H(3-0)**

Conference Course in Art History
Specialized study in an area of art history selected on the basis of particular interest and need.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Art History 617 **3 units; H(3-0)**

Thesis Development
A reading and conference course in the student's research area.

Prerequisite(s): Consent of the Department.

Arts ARTS

Instruction offered by the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Senior Courses

Arts 501 **3 units; H(3-0)**

International Study Topics
Group or individual study topics which involve international experience. Group study topics will vary from year to year.

Prerequisite(s): Third year standing.

Antirequisite(s): Credit for Arts 501 and Social Sciences 501 will not be allowed.

Note: Approval and registration for this course must take place prior to travel. Individual international study topics with a significant research component may also be approved for students traveling abroad. For further information, contact the Arts Students' Centre.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Arts 502 **3 units; H**

Academic Field Placement
Authorized academic field placements will vary from year to year.

Prerequisite(s): Acceptance to a recognized academic internship or field placement program and approval of the Faculty of Arts.

Antirequisite(s): Credit for Arts 502 and Social Sciences 502 will not be allowed.

Note: May be taken twice for credit. Students should contact the Centre for International Students and Study Abroad for information and advice concerning recognized academic internship opportunities such as the Washington Center Internship Program.

MAY BE REPEATED FOR CREDIT

Arts and Science Honours Academy ASHA

Instruction and services offered by the Faculties of Arts and Science.

Junior Courses

Arts and Science Honours Academy 220 **6 units; F(3-0)**

Quests and Questions
An introduction to a variety of perspectives on human culture. Students will inquire into such topics as the nature of discovery and creation, tradition and modernity, gender and social structure. These topics will be approached through careful analysis of artistic, literary, religious, philosophical and scientific texts.

Note: Open only to students in the Arts and Science Honours Academy Program. Successful completion of this course in the first year is required for continuation in the program.

Arts and Science Honours Academy 321 **3 units; H(3-0)**

Representation
Far more than a neutral reflection of the world, representation, be it of artistic, social or scientific phenomena, is a complex issue. Issues, inconsistencies and flaws arising from the concept of representation will be studied in a variety of contexts. Topics to be covered include: sensory perception from neurological, psychological and cultural perspectives; mimesis and metaphor in literature and the visual arts; and the use of images, imaging, and interpretative frameworks in the social and natural sciences.

Prerequisite(s): Arts and Science Honours Academy 220 and admission to the Arts and Science Honours Academy.

Arts and Science Honours Academy 421 **3 units; H(3-0)**

Invention
From the slingshot to steam power to intellectual property, from prophets to scientists to novelists; the theory and practice of invention looms large in human history and is of particular importance to the present age. This course will examine the nature and development of technological, conceptual, and linguistic invention in a variety of contexts.

Prerequisite(s): Arts and Science Honours Academy 321 and admission to the Arts and Science Honours Academy.

Arts and Science Honours Academy 501 **3 units; H(3-0)**

The Nature of Research
A consideration of academic research within the social, historical and political context of its production and use. Questions to be considered include, but are not limited to: the historical development of professions and disciplines; the cultural framework within which research is produced and the cultural uses of research; and the ways in which research creates objects of knowledge and serves to define and categorize human experience and identity.

Prerequisite(s): Arts and Science Honours Academy 421 and admission to the Arts and Science Honours Academy.

Arts and Science Honours Academy 503 **3 units; H(3-0)**

Capstone Seminar
Students will reflect on their intellectual journey from both disciplinary and interdisciplinary perspectives. Each student will prepare two separate presentations: one on a topic related to their experience abroad, the other related to their honours thesis or disciplinary specialty.

Prerequisite(s): Arts and Science Honours Academy 501 and admission to the Arts and Science Honours Academy.

Astronomy ASTR

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Note: For listings of related courses, see Astrophysics, Physics, Medical Physics, and Space Physics.

Junior Courses

Astronomy 207 **3 units; H(3-0)**

Introduction to Astronomy I - The Solar System
A comprehensive, descriptive overview of the solar system covering how ideas have changed from ancient times to today. The latest discoveries. The electromagnetic spectrum; telescopes and detectors; laws of planetary motion; planets, asteroids, comets, and the Sun. Formation of the solar system. Extra-solar planets and the possibility of extraterrestrial life. Possible field trip to the Rothney Astrophysical Observatory.

Antirequisite(s): Credit for Astronomy 207 and any of 205, 213 or Astrophysics 213 will not be allowed.

Note: Not recommended for physical science majors.

Astronomy 209 **3 units; H(3-0)**

Introduction to Astronomy II - The Cosmos
A comprehensive, descriptive overview of the universe outside the solar system. The electromagnetic spectrum; stellar spectra; distance determinations. Origin and evolution of stars; white dwarfs, neutron stars and black holes. The interstellar medium. Dark matter. Galaxies and quasars. The Big Bang. The fate of the universe. Possible field trip to the Rothney Astrophysical Observatory.

Antirequisite(s): Credit for Astronomy 209 and any of 205, 213 or Astrophysics 213 will not be allowed.

Note: Not recommended for physical science majors.

Astrophysics ASPH

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Note: For listings of related courses, see Astronomy, Physics, Medical Physics, and Space Physics.

Junior Course

Astrophysics 213 **3 units; H(3-1T-1)**

Introduction to Astrophysics
Fundamentals of modern astrophysics including observations and physical interpretation physical phenomena in the Universe. Topics include the nature of the Sun and stars, galaxies, and the interstellar medium; distances and motions in the universe; radiation and telescopes; celestial mechanics; stellar evolution. Minor laboratory exercises including one at the Rothney Astrophysical Observatory as circumstances permit.

Prerequisite(s): Physics 211 or 221 or 227 or Engineering 202.

Note: Recommended for science majors.

Senior Courses

Astrophysics 307 **3 units; H(3-3)**
(formerly Astrophysics 507)

Introduction to Observational Astrophysics
Lectures and practical laboratory sessions in observational astronomy. Students will collect, reduce, and interpret astronomical data, develop an understanding of telescopes, instruments, and detectors; reduction and analysis methods; simulations and model fitting; data and error analysis. Observations will be carried out at the Rothney Astrophysical Observatory and/or the main campus.

Prerequisite(s): Astrophysics 213; Physics 211 or 221 or 227, or Engineering 202 and Physics 255 or 259 or 323.

Astrophysics 401 **3 units; H(3-0)**

Galactic Astrophysics
The galaxy: space distribution of stars and interstellar material; kinematics and dynamics of stellar systems; rotation and spiral structure; classification and global properties of galaxies; active galaxies.

Prerequisite(s): Astrophysics 213, Physics 325, 381, and one of Mathematics 349 or 375 or Applied Mathematics 307.

Note: Taught in the Fall of even years.

Astrophysics 403 **3 units; H(3-0)**

Stellar Structure and Evolution
Observational properties of stars; equations of stellar structure; physics of stellar interiors; structure and evolution of stars; white dwarfs, neutron stars, black holes; observational aspects of stellar atmospheres; radiative transfer in stellar atmospheres; opacity; spectral line formation.

Prerequisite(s): Astrophysics 213, Physics 325, 381 and one of Mathematics 349 or 375 or Applied Mathematics 307.

Astrophysics 409 **3 units; H(3-0)**
(formerly Astrophysics 309)

Planetary Astrophysics
Orbital mechanics. Planetary interiors, surfaces, atmosphere, ionospheres and magnetospheres. Solar magnetism and activity cycles. Comets, asteroids, meteorites. Origin of the solar system. Exoplanets.

Prerequisite(s): Astrophysics 213, Physics 381, and Applied Mathematics 307 or Mathematics 375.

Note: Taught in the Winter of odd years.

Astrophysics 503 **3 units; H(3-0)**

The Interstellar Medium
Multiwavelength observations of gas and dust in our Galaxy; distribution and physics of neutral atomic hydrogen and molecules; interstellar chemistry; physics of dust grains; HII regions; interstellar shocks; gas dynamics; star formation.

Prerequisite(s): Astrophysics 213, Physics 325, 381, and one of Mathematics 349 or 375 or Applied Mathematics 307.

Note: Taught in the Fall of odd years.

Astrophysics 509 **3 units; H(3-0)**

High Energy Astrophysics and Cosmology
Clusters of galaxies; microwave and X-ray background radiation; dark matter and dark energy; overview of cosmology; general relativistic considerations; large-scale structure and expansion of the universe; nucleosynthesis; gamma ray bursts and cosmic rays.

Prerequisite(s): Astrophysics 213, Physics 325, 381, and one of Mathematics 349 or 375 or Applied Mathematics 307.

Note: Taught in the Winter of even years.

Graduate Courses

Astrophysics 607 **3 units; H(1-6)**

Advanced Observational Astrophysics
Principles and tools of modern ground-based and space astronomy emphasizing ultraviolet, optical, infrared, and radio radiation. Data acquisition and reduction techniques for astrometry, photometry, spectroscopy, imaging, and interferometry. Use of astronomical data analysis software.

Astrophysics 611 **3 units; H(3-0)**

Radio Astronomy
Wave propagation, antennas, interferometry, aperture synthesis, radio receivers, and spectrometers. Applications to continuum and line radiation in stars, interstellar medium and extragalactic objects.

Astrophysics 621 **3 units; H(3-0)**

High Energy Astrophysics
Interaction of high energy particles with matter, propagation and origin of cosmic rays; structure of white dwarfs and neutron stars; the physics of jets and the accretion process onto compact objects; supernovae and supernova remnants; active galactic nuclei.

Athletic Therapy ATTH

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, Kinesiology, and Physical Education.

Senior Courses

Athletic Therapy 491 **3 units; H(3-3)**

Advanced Practicum in Athletic Therapy
Practical case studies to develop leadership and problem solving skills applicable to Athletic Therapy issues. Practical experience in athletic equipment fitting, maintenance, selection, repair, and CSA certification.

Prerequisite(s): Successful completion of Mount Royal University Certificate in Athletic Therapy courses.

Biochemistry BCEM

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.

Students interested in taking Biochemistry courses are urged to read the advice in the Faculty of Science Program section of this Calendar.

†Limited amounts of non-scheduled class time involvement will be required for these courses.

Senior Courses

Biochemistry 341 **3 units; H(3-3/2)**

Biochemistry of Life Processes
Emphasis is placed on describing the chemistry of biochemical molecules including proteins, carbohydrates, lipids, and nucleic acids, and how this relates to cell structure and life processes. Basic concepts of metabolism are introduced, focusing on the breakdown of carbohydrates for energy. The laboratory component reinforces learning of the lecture material, while teaching technical skills and the analysis and interpretation of experiments involving biochemical molecules.

Prerequisite(s): Chemistry 351.

Antirequisite(s): Not open to majors in the Department of Biological Sciences or Natural Sciences concentrators in Biological Sciences. Credit for Biochemistry 341 and 393 will not be allowed.

†Biochemistry 393 **3 units; H(3-3/2)**

Introduction to Biochemistry
The structure and function of carbohydrates, amino acids, proteins, lipids, coenzymes and enzymes will be presented, along with an introduction to metabolism and energy transduction. Laboratory: Overview of current biochemical techniques for studying proteins, enzymes and metabolic pathways.

Prerequisite(s): Chemistry 351 and one of Biology 311 or Medical Sciences 341 (BHSc students only).

Antirequisite(s): Credit for Biochemistry 393 and 341 will not be allowed.

Note: Prior or concurrent completion of Biology 331 is strongly recommended. Biochemistry 393 and 443 are the recommended courses for students wishing to take only two biochemistry courses. These courses cover biochemistry broadly and include the topics students are expected to understand prior to admission to Medicine, Veterinary Medicine, Dentistry, Optometry and other professional schools having two courses in biochemistry as recommended preparation or requirements for admission.

Biochemistry 401 **3 units; H(3-6)**

Biochemistry Laboratory Techniques I
Recombinant DNA techniques, protein expression and mutagenesis stressing nucleic acid and protein properties relevant to these techniques. Practical experience in the laboratory includes DNA amplification (PCR), gene cloning and expression, nucleic acid-protein bioinformatics and introduction to methods for working with proteins. Emphasis on the scientific process: experimental design, data analysis and dissemination of results.

Prerequisite(s): Biochemistry 393 and one of Chemistry 353 or 355.

Antirequisite(s): Credit for Biochemistry 401 and either 541 or Cellular, Molecular and Microbial Biology 451 will not be allowed.

Note: Enrolment in this course may be limited. See Enrolment Limitations in Courses in the Faculty of Science section of this Calendar.

Biochemistry 403 **3 units; H(3-6)**

Biochemistry Laboratory Techniques II
Chromatography, protein purification, biophysical and enzymatic means of characterizing proteins. Practical experience in the laboratory with protein purification and protein characterization techniques selected to complement the selection from Biochemistry Laboratory Techniques I.

Prerequisite(s): Chemistry 311, Biochemistry 401 and 471.

Antirequisite(s): Credit for Biochemistry 403 and 541 will not be allowed.

Note: Enrolment in this course may be limited. See Enrolment Limitations in Courses in the Faculty of Science section of this Calendar.

Biochemistry 431 **3 units; H(3-0)**

Proteins and Proteomics
Protein structure and chemistry: structural motifs, ligand-binding, conformational changes, chemical modification; protein folding; structure prediction by molecular modelling. Identification of proteins in the proteome: 2D gel electrophoresis and chromatography, mass spectrometry; metalloproteins; post-translational modifications; protein-protein interactions.

Prerequisite(s): Biology 331, Biochemistry 393 and one of Chemistry 353 or 355.

Antirequisite(s): Credit for Biochemistry 431 and 531 will not be allowed.

Biochemistry 443 **3 units; H(3-4/2)**

Metabolism and Basic Nucleic Acid Biochemistry
Intermediary carbohydrate, lipid and nitrogen metabolism, and the regulation of these metabolic pathways; nucleic acid chemistry, structure, stability and enzymatic processing.

Prerequisite(s): One of Chemistry 353 or 355; and Biochemistry 341 or 393.

Note: Enrolment in this course may be limited. See Enrolment Limitations in Courses in the Faculty of Science section of this Calendar. Not required for majors in the Biochemistry program. Biochemistry 393 and 443 are the recommended courses for students wishing to take only two biochemistry courses. These courses cover biochemistry broadly and include the topics students are expected to understand prior to admission to Medicine, Veterinary Medicine, Dentistry, Optometry and other professional schools having two courses in biochemistry as recommended preparation or requirements for admission.

Biochemistry 471 **3 units; H(3-2T)**

Physical Biochemistry
The laws of thermodynamics as they apply to biological systems: the hydrophobic effect, properties of water, electrolyte solutions and ligand binding. Optical spectroscopic methods including UV/visible absorption, fluorescence, and infrared as applied to biological molecules.

Prerequisite(s): Biochemistry 341 or 393; Chemistry 353 or 355; one of Mathematics 249, 251, 265, 275, 281, or Applied Mathematics 217 and one of Mathematics 253, 267, 277, 283, 211, 213, or Applied Mathematics 219; and Physics 211 or 221, and 223.

Biochemistry 507 **3 units; H(0-8) or H(3-0)**

Special Problems in Biochemistry
Independent research or reading project that may include seminars, lectures, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 54 units (9.0 full-course equivalents) and consent of the Department.

Note: Students completing a typical course sequence in their program would normally be eligible to enrol in their 3rd or 4th year. After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

MAY BE REPEATED FOR CREDIT

Biochemistry 528 **6 units; F(0-8)**

Independent Studies in Biochemistry
Original and independent thought, practical research and the completion of written and oral reports.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

MAY BE REPEATED FOR CREDIT

Biochemistry 530 **6 units; F(0-8)**

Honours Research Project in Biochemistry
Research project under the direction of one or more faculty members in the Department of Biological Sciences. Formal written and oral reports must be presented on completion of this course. Open only to Honours Biochemistry students or Honours Biological Sciences students.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a department faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be completed before a student can register.

Biochemistry 541 (Chemistry 541) **3 units; H(3-0)**

Biochemical Toxicology
An interdisciplinary course focused on the diverse biomolecular mechanisms by which organic (e.g. PCB's) and inorganic pollutants (e.g. Cd, Hg, As) adversely affect cell function examined at multiple levels of organization, from molecules to whole animals organisms. Topics include how natural toxins exert toxicity, how toxins/light generate free radicals within cells, how the speciation of metals in the environment affects their bioavailability/toxicity, and the toxicity mechanisms that lead to homeostatic dysfunction.

Prerequisite(s): Any two of: Biology 231, 233, 241 or 243; Biochemistry 341 or 393; Chemistry 311, 321 and 351.

Biochemistry 543 **3 units; H(3-0)**

Enzymology
The structure, mechanisms and biological interactions of enzymes. Binding, catalysis, rates and regulation will be discussed with regard to chemical principles of kinetics and reaction. The principles of enzyme action will be considered in the context of the biological role that enzymes play.

Prerequisite(s): Biochemistry 393 or 443, and Chemistry 353 or 355.

Biochemistry 547 **3 units; H(3-0)**

Signal Transduction and Regulation of Metabolism
Principles of signal transduction with examples from prokaryotes and eukaryotes. Discussion of protein covalent modifications, inositol lipid signaling, structure and function of protein kinases and protein phosphatases and their role in regulating various aspects of cell function. Emphasis on metabolic pathways, cell cycle control, checkpoints, DNA damage response and epigenetics.

Prerequisite(s): Biochemistry 393 or 443.

Biochemistry 551 **3 units; H(3-0)**

Structural Biology
Applications of modern methods to structural studies of proteins and nucleic acids by NMR and X-ray crystallography with a comparison of the structural information derived from the two methods. Crystallization of macromolecules. Experimental and theoretical foundations of X-ray and NMR structure determination, and ligand binding. Non-invasive NMR studies of metabolism, and magnetic resonance imaging.

Prerequisite(s): One of Biochemistry 341 or 393; and one of Biochemistry 471 or Chemistry 371.

Biochemistry 553 (formerly Biology 553) **3 units; H(3-0)**

Molecular Biophysics
A comprehensive survey of modern biophysics covering the flow and processing of matter, energy and information in living systems. Equilibrium and non-equilibrium thermodynamics in biology. Molecular motors and facilitated proton transport. An integrative approach connecting atomistic theories to cellular processes.

Prerequisite(s): Biochemistry 341 or 393; and Biochemistry 471 or Chemistry 371.

Note: Prior completion of Biochemistry 555 is strongly recommended.

Biochemistry 555 **3 units; H(3-0)**

Biomembranes
The material examines the structure and function of biological membranes with a strong emphasis on the role of membrane proteins. Topics may include: the physical properties of lipid bilayers, isolation and purification of membrane proteins, preparation of membrane mimetic systems, ion and solute movement across membranes (transport and ion channels), membrane protein folding, assembly and structure, and protein secretion and translocation systems.

Prerequisite(s): Biochemistry 431 and 471 and one of 393 or 443.

Biochemistry 561 **3 units; H(3-0)**

Applied Biochemistry and Biotechnology
An introduction to the language, materials, methods, concepts and commercial applications of biotechnology with emphasis on methodology, proteins as products, and the impact of genome sequencing on biotechnology. Topics will also include microbial, animal, and bioremediation biotechnology, expanding the genetic code, synthetic biology, antibiotic resistance, cancer immunotherapy, stem cells, and gene therapy.

Prerequisite(s): Biochemistry 393.

Note: Prior completion of Cellular, Molecular and Microbial Biology 411 or Biochemistry 401 is strongly recommended.

Biochemistry 575 **3 units; H(3-1T-0)**

Lipids
Structure and function of lipids including phospholipids, sphingolipids, and steroids. Topics include properties of lipids and bilayers, lipid-lipid and lipid-protein interactions, technological applications, biosynthesis and regulation, lipids as second messengers, intracellular trafficking, and lipids in physiology and disease. Literature review and student seminars are significant components of this course.

Prerequisite(s): Biochemistry 393 and one of Biochemistry 401 or 443.

Biochemistry 577 **3 units; H(3-4)**

Biomolecular Simulation
Introduction to simulation and computer modelling methods commonly used in biochemistry and biophysics, with a focus on physical models to understand the behaviour of biomolecules. Topics include simulation methods, dynamics of proteins, DNA, and lipids, calculation of binding constants, protein-drug interactions, properties of ion channels as well as a number of recent literature topics.

Prerequisite(s): One of Biochemistry 341 or 393 and one of Biochemistry 471 or Chemistry 371.

Graduate Courses

Enrolment in any graduate course requires consent of the Department.

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

600-level courses are available with permission to undergraduate students in the final year of their programs.

See also the separate listing of graduate level Chemistry courses.

Biochemistry 641 **3 units; H(3-0)**

Selected Topics in Biochemistry
Selected topics in Biochemistry such as those which appear annually in the serial publication Annual Review of Biochemistry.

MAY BE REPEATED FOR CREDIT

Biochemistry 731 **3 units; H(3-0)**

Current Topics in Biochemistry
A discussion of contemporary experimental and theoretical biochemical methods used for the study of drugs and diagnostics at a molecular level. Structural analysis, drug design and molecular dynamics methods will be described, as well as current practices for commercialization. Various modern 'omics' research approaches and current leading drug targets of the pharmaceutical industry will also be discussed.

Biology BIOL

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.

For other courses offered by the Department of Biological Sciences see Biochemistry; Cellular, Molecular and Microbial Biology; Ecology; Marine Sciences; Plant Biology; Zoology.

†Limited amounts of non-scheduled class time involvement will be required for these courses.

Junior Courses

Biology 205 **3 units; H(3-0)**

The Organization and Diversity of Life
A study of biological concepts and mechanisms illustrated by current examples of medical and environmental problems.

Antirequisite(s): Not open for credit to Honours, Majors or Minors in the Department of Biological Sciences or to Natural Sciences program students with a Concentration in Biological Sciences. Credit for Biology 205 and any of 231, 233, 241 and 243 will not be allowed.

Biology 241 **3 units; H(3-3)**

Energy Flow in Biological Systems
An introduction to the energetics of life from molecules through ecosystems. Topics include: energy in biological systems; how different organisms obtain, store and use energy; energy budgets of organisms; and energy flow through cells and ecosystems.

Prerequisite(s): Biology 30 and Chemistry 30.

Antirequisite(s): Credit for Biology 241 and 205 will not be allowed. Credit for more than two of Biology 231, 233, 241, 243 will not be allowed.

Note: Biology 241 is a prerequisite for Biology 243. Not recommended for students seeking a single course, general-interest overview of the biological sciences. Those seeking such a course should consider Biology 205.

Biology 243 **3 units; H(3-3)**

DNA, Inheritance and Evolution
An introduction to central concepts in evolution and DNA as a vehicle for inheritance of genetic information. Topics include: the nature of genetic information and inheritance including transcription, translation and replication; natural selection and speciation; origin and history of biodiversity.

Prerequisite(s): Biology 241.

Antirequisite(s): Credit for Biology 243 and 205 will not be allowed. Credit for more than two of Biology 231, 233, 241, 243 will not be allowed.

Note: Not recommended for students seeking a single course, general-interest overview of the biological sciences. Those seeking such a course should consider Biology 205.

Senior Courses

Biology 305 **3 units; H(3-0)**

The Human Organism
An introduction to human biology that analyzes the structure and function of systems in our bodies. Leads to an appreciation of how the human body maintains itself and carries out the functions necessary to sustain any organism. A course for non-majors that will develop their understanding of the anatomy and physiology of their own species in a zoological and evolutionary context.

Prerequisite(s): One of Biology 30 or 205 or 231 or 241.

Antirequisite(s): Not open for credit to Honours, Majors and Minors in the Department of Biological Sciences or to Natural Sciences program students with a Concentration in Biological Sciences. Credit for Biology 305 and any of Kinesiology 259, 260, Zoology 269, 361, 363, 461 or 463 will not be allowed.

Biology 307 **3 units; H(3-0)**

Ecology and Human Affairs
The major principles of ecology. How the physical environment affects organisms; behavioural ecology and life histories; species interactions; the biology of populations, communities, and ecosystems; biodiversity and conservation. The non-biologists will gain an understanding of ecological and evolutionary principles that will allow them to better appreciate the natural world, and the increasing environmental impacts of humans.

Prerequisite(s): 24 units (4.0 full-course equivalents).

Antirequisite(s): Not open for credit to Honours, Majors and Minors in the Department of Biological Sciences or to Natural Sciences program students with a Concentration in Biological Sciences, or to students in the Environmental Sciences program.

Biology 309 **3 units; H(3-0)**
(formerly Botany 309)

Plants and People
A review of the structure and function of plants. A survey of the nature of people's basic food plants and an overview of agricultural and forestry practices. Plant improvement by traditional and modern methods, and plant propagation.

Prerequisite(s): Biology 205 or 231 or 241.

Antirequisite(s): Not open for credit to Honours, Majors and Minors in the Department of Biological Sciences or to Natural Sciences program students with a Concentration in Biological Sciences.

†Biology 311 **3 units; H(3-3)**

Principles of Genetics
Topics will include Mendelian inheritance, allelic relationships, genetic linkage, sex linkage, changes in chromosome structure, segregation and recombination, epistasis, molecular genetics, genetics of bacteria and viruses, gene fine structure, gene function, complementation, bioinformatics and regulation of gene expression. Several selected organisms will be used in the laboratories to illustrate pertinent genetic principles.

Prerequisite(s): Any two of Biology 231, 233, 241 and 243.

Note: Students are urged to complete this course in their second year to ensure timely completion of the program.

Biology 313 **3 units; H(3-3)**

Principles of Ecology
The ecological principles, theories and interactions of organisms at individual, population, community and ecosystem levels will be explored. Ecological principles will be applied to examine current issues involving conservation of species, habitats, biodiversity and ecosystem function.

Prerequisite(s): 24 units (4.0 full-course equivalents), including Biology 233 or any two of Biology 231, 241 and 243.

Note: Students are urged to complete this course in their second year to ensure timely completion of their program.

Biology 315 **3 units; H(3-3)**

Quantitative Biology I
Data collection, presentation and analysis in the biological sciences. Basic design of biological experiments including concepts of control, replica-

tion, and interspersion. Analysis of biological data will include tests of statistical hypotheses and estimation techniques.

Prerequisite(s): Biology 233 or 241.

Note: Biology 315 is a prerequisite for several Ecology courses offered by the department. Students are urged to complete this course in their second year to ensure timely completion of the program. Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Biology 331 **3 units; H(3-1T)**

Introduction to Cellular and Molecular Biology
The principles of cellular structure and function. Molecular organization of membranes, organelles, nucleus and cytoplasmic structures; the integration of cellular functions; assembly of organelles; the regulation of cell proliferation; and the interaction of cells with their neighbours and their environment.

Prerequisite(s): Biology 311.

Note: Students are urged to complete this course in their second year to ensure timely completion of their program.

Biology 371 **3 units; H(3-1T)**

Comparative Biology of Plants and Animals
An exploration of how multicellular organisms meet the challenges of living, both as individuals, and in an evolutionary context. Parallels and divergence between plants and animals are illustrated in their responses to the challenges they face, with the water-to-land transition forming a central theme in shaping the form and function of plant and animal life.

Prerequisite(s): Biology 241 and one of Biology 243 or 231.

Antirequisite(s): Biology 233.

Note: Students are urged to complete this course in their second year to ensure timely completion of their program.

Biology 375 **3 units; H(3-0)**

Insects, Science and Society
Examination of insects as the most diverse and abundant form of animal life on the planet, why they are so successful and how they influence our lives. Topics include how insects are built, what they do, and how they interact with people and have come to be so important economically and culturally, as pests, pollinators, experimental animals, maintaining our environment and forming complex societies. Other topics include evolution of insects, insects in history and culture and how insects can help us address issues such as biological conservation, climate change and animal rights.

Prerequisite(s): 24 units (4.0 full-course equivalents).

Antirequisite(s):

Not open for credit to honours, majors or minors in the Department of Biological Sciences or to Environmental Science and Natural Sciences program students with a Concentration in Biological Sciences.

Biology 401 **3 units; H(3-1T)**

Evolutionary Biology
An introduction to the micro- and macro-evolutionary processes responsible for the diversity of organisms. Topics include heredity, genetic variation, population structure, genetic drift, natural selection and adaptation, sexual selection, evolution of interactions between species, speciation, phylogeny and biogeography.

Prerequisite(s): Biology 313 and 315.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Biology 435 **3 units; H(3-3/2)**

Biology of Fungi
Morphology, life history patterns and systematics of fungi. Fungal ecology including fungi as parasites, symbionts and decomposers. Basic molecular biology, genetics and physiology.

Prerequisite(s): Biology 313 and 331.

Antirequisite(s): Credit for Biology 435 and 335 will not be allowed.

Biology 451 **3 units; H(3-1T)**

Conservation Biology
The application of ecological theory and principles to the conservation and management of natural and modified ecosystems, with emphasis on preservation of biodiversity and sustainable development. Topics include disturbance as an ecological process, ecological and evolutionary responsiveness of natural systems, ecology of resource harvesting, management of endangered habitats and populations, implications of human population growth and global change.

Prerequisite(s): Biology 313.

Biology 453 **3 units; H(3-0)**
(formerly Biology 351)

Plants in their Environment
An integration of physiological and ecological aspects of plant adaptation to different environments. Topics include interactions between plants and other organisms (e.g., bacterial and fungal symbionts, animal pollinators, herbivores) as well as the influence of abiotic stressors on plant growth and distribution. The ecological consequences and possible applications of such interactions are discussed.

Prerequisite(s): Biology 313 and one of Botany 303, Biology 371 or Plant Biology 403.

Biology 501 **3 units; H(3-0)**
(Medical Science 501)

Principles and Mechanism of Pharmacology
Basic principles of pharmacology, with specific emphasis on receptor signaling mechanisms.

Prerequisite(s): Biochemistry 443 and one of Zoology 461, 463, or Medical Science 404 and consent of the Department.

Biology 503 **3 units; H(3-0)**
(Medical Science 503)

Pharmacology of Organ Systems
Pharmacology of the nervous, cardiovascular, renal and immune systems, as well as anti-cancer therapies. Principles of toxicology.

Prerequisite(s): Biology 501 (Medical Science 501).

Biology 505 **3 units; H(3-0)**

Medicinal Plant Biochemistry
Deals with biochemical, molecular, and cellular aspects of plant metabolism, natural product diversity in the plant kingdom, and modern molecular and biochemical methods to understand plant metabolism. The focus is on the metabolic pathways that are either unique to plants, or that exhibit unique features in, plants. Several key plant pathways that produce plant-derived medicines will be discussed.

Prerequisite(s): Biology 331 and Biochemistry 393.

Antirequisite(s): Credit for Biology 505 and Botany 503 will not be allowed.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Biology 515 **3 units; H(3-0)**
(Medical Science 515)

Cellular Mechanisms of Disease
The cellular and molecular mechanisms underlying basic human disease processes and how these can be influenced by lifestyle and environmental factors. The ways in which this knowledge can be used in the laboratory diagnosis of disease.

Prerequisite(s): Biochemistry 443 and one of Biology 331 or Medical Science 351.

Biology 520 **6 units; F(3-3)**

Field Course in Tropical Biology
An examination of biodiversity in a selected region of the tropics, including aspects of ecology of animals and plants, animal behaviour and an introduction to field techniques for observing and censusing selected taxa. Field studies will take place at forest and savannah sites with consideration of community-based conservation efforts.

Prerequisite(s): Consent of the Department.

Note: A supplementary fee will be assessed to cover additional costs associated with this course.

Biology 530 **6 units; F(0-8)**

Honours Research Project in Biological Sciences
Research project under the direction of one or more faculty members in the Department of Biological Sciences. Formal written and oral reports must be presented on completion of this course. Open only to Honours Biological Sciences students.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a department faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be completed before a student can register.

Biology 591 **3 units; H(1-5)**

Insect Biodiversity
A field course in the natural history and classification of insects, one of the most diverse groups of organisms known, as they are encountered in their natural habitat. Course material will include: techniques for collection and identification of major groups of insects and related terrestrial arthropods; aspects of behaviour and ecology of local species; use of insects as indicators of environmental change; censusing/monitoring insect populations.

Prerequisite(s): Biology 243 and 313 and consent of the Department.

Graduate Courses

Enrolment in any graduate course requires consent of the Department.

Only when appropriate to a student's program may graduate credit be received for courses numbered 500-599.

600-level courses are available with permission to undergraduate students in the final year of their program.

Biology 601 **3 units; H(1S-0)**

Research Seminar
Reports on studies of the literature or of current research. Graduate students normally register in their supervisor's research cluster.

601.01. Biochemistry I

601.02. Biochemistry II

601.03. Integrative Cell Biology I

601.04. Integrative Cell Biology II

601.05. Ecology and Evolutionary Biology I

601.06. Ecology and Evolutionary Biology II

601.11. Microbiology I

601.12. Microbiology II

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Biology 603 **3 units; H(3-1)**
(Medical Science 603) (Veterinary Medicine 603)

Biology of Laboratory Animals
The course is based on the Canadian Council on Animal Care Syllabus "Basic Principles of Laboratory Animal Science for Research Scientists." In addition to the study of common, research, farm and exotic animals, topics to be covered include ethical considerations, regulation and legislation, animal models, animal facilities and husbandry, hazard control, surgery, anaesthesiology, euthanasia and post-mortem examinations. Practical sessions will provide experience in handling and restraint of specific laboratory animals, injections, blood collection, anaesthesiology and surgery.

Note: Enrolment in this course is restricted in the first instance to graduate students who will do research utilizing animals.

Biology 607 **3 units; H(3-0 or 0-6)**

Special Problems in Biology
Independent research or reading project that may include seminars, term papers and training in theoretical and/or laboratory methods.

MAY BE REPEATED FOR CREDIT

Biology 609 **3 units; H(3-0)**

Advanced Statistical Applications in Biology
This course explains and demonstrates the analysis of biological data with general linear models, generalized linear models, maximum-likelihood fitting of non-linear models, and resampling techniques. Content is presented in a workshop format, so that students learn the application of computer analysis coincidentally with statistical concepts.

Prerequisite(s): Familiarity with statistical inference, regression, and ANOVA-based experimental design (equivalent of Ecology 425) is required.

Note: Offered during odd-even dated academic years.

Biology 617 **3 units; H(3-0)**

Darwin's Origin of Species
An examination of the first edition of Charles Darwin's "On the Origin of Species" and related writings. Students will lead discussions of scientific, philosophical, and other issues raised by the book, and write a term paper on a related topic of their choice.

Prerequisite(s): Consent of the Department.

Note: The instructor does not assume an advanced background in biology and will not focus on technical scientific issues. May not be offered every year.

Biology 619 **3 units; H(3-0)**

Advanced Evolutionary Biology
The theory of organic evolution. Historical development of evolutionary ideas. Darwin's contribution. The mechanism of natural selection; sexual, kin and group selection. The application of the theory in biogeography, ecology, ethology and other areas of biology.

Note: Offered during odd-even dated academic years.

Biology 703 **3 units; H(3-0) or H(0-6)**

Recent Advances in Biology
Lectures, seminars and/or laboratories on special advanced topics in biological sciences. Each student should seek consent of a departmental faculty member who will supervise the chosen study.

MAY BE REPEATED FOR CREDIT

Biomedical Engineering BMEN

Instruction offered by members of the Schulich School of Engineering, Faculty of Kinesiology, and for graduate-level courses, other faculties involved in the multi-faculty Biomedical Engineering Graduate Program.

Senior Courses

Biomedical Engineering 301 **3 units; H(3-2)**

Introduction to Biomedical Engineering
Fundamentals of biological systems and the application of engineering principles to solving problems in medicine. Topics include pharmaceuticals and drug delivery, instrumentation and devices, physiological and biological measurements, biomechanics, the Scientific Method and the Canadian health care system. Applications may include cardiovascular, neural and musculoskeletal systems.

Biomedical Engineering 309 **3 units; H(3-3/2)**

Anatomy and Physiology for Engineers
Physiological terminology and anatomical planes of reference; cell biology and physiology; includes structure and function of musculoskeletal, cardiac, nervous, gastrointestinal and respiratory tissues and systems; diseases and disorders of those systems; design constraints for bioengineering products.

Biomedical Engineering 401 **3 units; H(3-1T)**

Fundamentals of Biomedical Device Design
An introduction to the development of biomedical devices. Topics may include identifying market needs, idea generation, biologically inspired deign, human factors related to design, regulatory issues, intellectual property protection, clinical trials, and commercialization considerations. Case studies may be drawn from cardiovascular, neural and musculoskeletal applications.

Prerequisite(s): Biomedical Engineering 301.

Antirequisite(s): Biomedical Engineering 517 and 619.05.

Biomedical Engineering 500 **9 units; M(1-8)**

Biomedical Engineering Research Thesis
A research project in an area of interest, directed by a project advisor/faculty member within the Schulich School of Engineering, Cumming School of Medicine, Faculty of Kinesiology, or Faculty of Science. Includes a lecture component covering the scientific process, ethics, review of literature, and writing scientific proposals and manuscripts. The course culminates with a written thesis and presentation. Projects may involve experimental, analytic or computer modelling studies.

Prerequisite(s): Fourth- or fifth-year standing in the Engineering program of choice.

Note: Pre-term study is required.

Biomedical Engineering 501 **3 units; H(1-2)**

Biomedical Engineering Project
A project in an area of interest, supervised by a project advisor/faculty member within the Schulich School of Engineering, Cumming School of Medicine, Faculty of Kinesiology, or Faculty of Science. Includes a lecture component covering topics including the scientific process, ethics, review of literature, patent searches, market analysis, and technology evaluation. The project involves choosing a particular product, process or theory relevant to biomedical engineering, researching it and justifying its selection. A final report and presentation are required.

Prerequisite(s): Fourth- or fifth-year standing in the Engineering program of choice.

Note: Pre-term study is required.

Biomedical Engineering 509 **3 units; H(3-2)**

Introduction to Biomedical Imaging and Applications
Principles of various imaging modalities used in Biomedical engineering applications, including CT, MRI, ultrasound, PET, SPECT. Image processing operations: filtering, enhancement, feature extraction, pattern recognition and image reconstruction. Image registration and integration of different imaging modalities.

Prerequisite(s): Fourth- or fifth-year standing in the Engineering program of choice.

Biomedical Engineering 511 **3 units; H(3-2/2)**

Biomaterials and Biocompatibility
Basic chemical and mechanical properties of biological and synthetic materials and their role in biological system health, dysfunction, and repair. Role of microstructure, material properties, and biocompatibility aspects in selection of biomaterials for medical or industrial applications. Incorporation of biomimetic concepts in material design. Topics may include artificial and tissue engineered products, implants, prostheses, biofilms, biosensors, and foreign body response.

Prerequisite(s): Fourth- or fifth-year standing in the Engineering program of choice.

Biomedical Engineering 513 **3 units; H(3-2)**

Photogrammetric Techniques for Reconstruction and Manipulation of Biomedical Data
Basic photogrammetric principles. Photogrammetric techniques for biomedical applications; image acquisition, camera calibration, bundle adjustment, conventional and x-ray imagery, accurate geometric measurements; multivariate least-squares estimation and object reconstruction from 2D and 3D imagery. Other photogrammetric techniques, including laser scanning, range cameras, and coded light projection. Applications in motion capture, implant measurement, facial measurement, and computer-assisted surgery.

Prerequisite(s): Fourth- or fifth-year standing in the Engineering program of choice.

Biomedical Engineering 515 **3 units; H(3-0)**

Bioengineering Methods in Systems Biology and Physiology
Concepts from systems theory, differential equations, and stochastic processes applied to physiological and biological systems. Experimental and computational approaches to the study of gene

expression and gene networks. Use of quantitative model-based approaches for integrative analysis of physiological and biological functions. Case studies of applications to disease mechanisms and the drug discovery process.

Prerequisite(s): Mathematics 375 or Applied Mathematics 307.

Biomedical Engineering 519 3 units; H(3-2)

Special Topics in Biomedical Engineering
Current topics in Biomedical Engineering.

Prerequisite(s): Consent of the BMES Director or designate.

MAY BE REPEATED FOR CREDIT

Biomedical Engineering 525 3 units; H(3-2)

Biomechanics of Tissues
The structure and functional behaviour of complex tissues which make up the human musculoskeletal system (bone, cartilage, muscles, tendons, ligaments) and cardiovascular systems (heart, blood vessels) will be explained by applying basic principles of mechanics as well as continuum mechanics. Introductory topics include: review of linear and tensor algebra, kinematics of continua, deformation gradient, deformation and strain tensors, Cauchy stress tensor and equilibrium, conservation laws, stress power and measures of stress. Constitutive equations for solids and fluids will be introduced as they apply to the study of biological tissues; anisotropy and inhomogeneity, fibre-reinforced non-linear behaviour.

Prerequisite(s): Engineering 317 and 349.

Antirequisite(s): Credit for Biomedical Engineering 525 and 405 will not be allowed.

Biomedical Engineering 585 3 units; H(3-2/2)

Molecular, Cellular and Tissue Engineering
Concepts, calculations, and methodologies in molecular, cellular and tissue engineering will be discussed and applied to solve problems in the areas of molecular diagnostics, pharmaceuticals, nanomedicine and regenerative medicine. Topics include cell biology and culture, stem cells, bioreactors, biomaterials, drug delivery, fluid dynamics, kinetics, and diffusion.

Prerequisite(s): Fourth- or fifth-year standing in the Engineering program of choice.

Antirequisite(s): Credit for Biomedical Engineering 585 and any of Biomedical Engineering 407, Biomedical Engineering 519.09, and Chemical Engineering 541 will not be allowed.

Graduate Courses

Biomedical Engineering 600 3 units; H(4-0) (formerly Biomedical Engineering 611/612/613/614)

Biomedical Engineering Foundations
An introduction to core concepts of Biomedical Engineering including an introduction to biomedical engineering fundamentals. Course allows students to select between a biology focused or an engineering focused fundamental module to complement previous course work (with approval of course instructor).

Biomedical Engineering 602 3 units; H(2-0) (formerly Biomedical Engineering 611/612/613/614)

Biomedical Engineering Core I
Topics may include an introduction to a) biomedical engineering research, research integrity and ethics, b) career paths and progression in biomedical engineering and c) oral research communication skills.

Antirequisite(s): Credit for Biomedical Engineering 602 and either 605 or 607 will not be allowed.

NOT INCLUDED IN GPA

Biomedical Engineering 604 3 units; H(2-0) (formerly Biomedical Engineering 611/612/613/614)

Biomedical Engineering Core II
Topics may include an introduction to a) research methodology, including experimental design and b) written research communication skills in biomedical engineering, and c) preparation and review of research proposals. Satisfactory completion of this course within one year of first registration will ensure that the Biomedical Engineering Graduate Program Research Proposal requirements are met.

Antirequisite(s): Credit for Biomedical Engineering 604 and either 605 or 607 will not be allowed.

NOT INCLUDED IN GPA

Biomedical Engineering 605 1.5 units; Q(1.5S-0)

Research Seminars in Biomedical Engineering
Reports of studies of the literature or of current research.

NOT INCLUDED IN GPA

Biomedical Engineering 607 1.5 units; Q(1.5S-0)

Research Seminars in Biomedical Engineering
Reports of studies of the literature or of current research.

NOT INCLUDED IN GPA

Biomedical Engineering 609 3 units; H(3-3/2)

Anatomy and Physiology for Biomedical Engineers
Advanced instruction on human skeletal structure, types of connective tissues, structure of joints, muscle and organ structure and function, cardiac physiology, blood properties and flow, introduction to autonomous nervous system, and disorders of the musculoskeletal system. Other topics will be covered dependent on the interests of the instructor and students.

Biomedical Engineering 619 3 units; H(3-0)

Special Problems in Biomedical Engineering
Designed to provide graduate students, especially at the PhD level, with the opportunity of pursuing advanced studies in particular areas under the direction of a faculty member.

MAY BE REPEATED FOR CREDIT

Botany BOTA

Please see Plant Biology PLBI.

Business and Environment BSEN

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Business and Environment 395 3 units; H(3-0)

Business Law for Strategic Decision-Makers
Business law topics may include: regulatory compliance and environment management, tort and contractual liability, legal issues affecting the strategic management of sole proprietorships, partnerships, corporations and joint ventures, personal liability of corporate directors and officers, intellectual property, advertising and promotion law, consumer protection legislation, legal issues affecting employees and independent contractors, the strategic management of international business, securities law and other current business law issues.

Prerequisite(s): 24 units (4.0 full-course equivalents).

Business and Environment 401 3 units; H(3-0)

Business in Canada
A comparative analysis of Canada's competitive position in the global economy utilizing case studies analyzing strategies employed by Canadian corporations to be successful in world markets.

Prerequisite(s): Entrepreneurship and Innovation 201.

Note: Fourth year standing is highly recommended. Not available for credit toward the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Business and Environment 559 3 units; H(3-0)

Selected Topics in Business and Environment
Investigation of selected topics related to business and environment issues.

Prerequisite(s): Admission to the Haskayne School of Business.

Note: Third year standing is highly recommended. For certain topics, consent of the Haskayne School of Business will be required.

MAY BE REPEATED FOR CREDIT

Business and Environment 561 3 units; H(3-0)

Ethical Issues and the Professional Manager
Major ethical principles are evaluated from different perspectives to provide tools for making sound ethical decisions in various business situations and in the face of moral dilemmas.

Prerequisite(s): Admission to the Haskayne School of Business and 30 units (5.0 full-course equivalents).

Business and Environment 595 3 units; H(3-0) (formerly Business and Environment 559.12)

Advanced Business Law
Various advanced topics that are of current interest in business law. These topics may probe deeper into several of the topics covered in the introductory business law course or may introduce new legal topics of current interest to business managers.

Prerequisite(s): Admission to the Haskayne School of Business and Business and Environment 395.

Graduate Courses

Business and Environment 691 3 units; H(3-0) (Civil Engineering 691)

Fundamentals of Project Management
Application of management principles to the project environment; planning, control, scope, time and cost processes; project organization and human resource issues. Students review a current major capital project and submit and defend a project report.

Prerequisite(s): Consent of the Program Director.

Business and Environment 719 3 units; H(3-0)

Project External Issues
Projects will focus on the effects of external factors on business. External factors may include: corporate influences; financial interfaces; sources

of funds; lending environment, owner's and lender's risks; government involvement; regulatory requirements; public interfaces; public information; compensation; project commissioning.

Prerequisite(s): Business and Environment 691.

Business and Environment 749 3 units; H(3-0)

Rediscovering Leadership: The Haskayne Wilderness Retreat
One-week intensive wilderness retreat combines experiential outdoor activities and personal growth challenges with cross-cultural First Nations teachings and ceremonies to deliver core leadership skills for social responsibility and sustainable development.

Business and Environment 751 3 units; H(3-0)

Strategies for Sustainable Development
The strategic context for making business decisions with respect to sustainable development issues. The role of sustainability in economic development, international trade relations and emerging technologies. Stakeholder perspectives and the effect of environmental and social issues on industrial performance.

Business and Environment 753 3 units; H(3-0)

Managing Social and Environmental Issues in the Global Market Place
Canadian companies operating in the international arena find themselves faced with an increasingly complex array of social and environmental risks that threaten their strategic objectives. This course examines this new class of strategic corporate risks through a review of changes in international sustainable development policy initiatives, changes in communications, the emergence of an environmental and social activist sector, and the interaction of these factors resulting in new international business risk challenges. The course uses lectures, cases, simulations and class discussion of theories and concepts.

Business and Environment 761 3 units; H(3-0)

Ethics and the Professional Manager
The role of values in business decision making; alternative moral codes and their principles; moral principles as decision tools, and reasoning through moral dilemmas; role of business in society; specific issues in business ethics; application through cases and exercises.

Business and Environment 777 3 units; H(3-0)

Global Environment of Business
Economic, political, social and legal factors affecting management decisions. Topics may include Canada in the world economy, business and government relations, business ethics and legal environment for business. Develops knowledge and ability to analyze and deal with complexities of the business environment.

Corequisite(s): Strategy and Global Management 601 or consent of the Haskayne School of Business.

Business and Environment 789 3 units; H(3S-0)

Seminar in Business and Environment
Study and discussion of current research literature and contemporary issues on topics related to Business and Environment.

MAY BE REPEATED FOR CREDIT

Business and Environment 793 3 units; H(3-0)

Legal Environment of Business
The study of the various areas of business law. Topics may include: contracts, patents and copyrights, product liability, incorporation and other relevant legal issues.

Prerequisite(s): Human Resources and Organizational Dynamics 601, Operations Management 601, Business Technology Management 601, Accounting 601 or equivalent.

Business and Environment 797 3 units; H(3S-0)

Advanced Seminar in Business and Environment
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Business Technology Management BTMA

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Business Technology Management 317 3 units; H(3-3T) (formerly Management Information Systems 317)

Introduction to Business Technology Management
Focus is on digital business technology management and enterprise applications. Foundation areas include: digital business strategy, strategy alignment, enterprise analysis, IT platforms, data management, business analytics, IT governance, IT innovation, organizational impacts, and economic considerations. Technical skills are developed with an examination of managerial and leadership issues.

Prerequisite(s): Admission to the Haskayne School of Business, and either Management Studies 217 and Strategy and Global Management 217, or Business and Environment 291 and Computer Science 203.

Antirequisite(s): Credit for Business Technology Management 317 and 321 will not be allowed.

Business Technology Management 321 3 units; H(3-0) (formerly Management Information Systems 321)

Information Technology in Business
Introduction to the fundamentals of business technology management and how such systems facilitate business transactions and decision-making at all levels of management. Topics examine the development, organization, management, control, and evaluation of information systems. Societal implications of the use of computer and networking technologies in business are also examined.

Prerequisite(s): 30 units (5.0 full-course equivalents).

Antirequisite(s): Credit for Business Technology Management 321 and 317 will not be allowed.

Note: Not available for credit towards the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Business Technology Management 331 3 units; H(3-1) (formerly Management Information Systems 331)

Data Management and Business Analytics
In today's world, businesses, consumers, and societies create massive amounts of data, by design and as a by-product of their activities. Businesses in every industry are harnessing the power of data to support operations, decision-making, planning, and risk management. Students will focus on organizing, storing, and managing the available data using relational database technologies and generating insights through business analytics techniques.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 333 3 units; H(3-0) (formerly Management Information Systems 333)

Enterprise Analysis
Focus is on enterprise analysis and high level design of IT-enabled solutions to business problems. Emphasis is placed on problem identification, requirements determination, system development methodologies, modelling the enterprise architecture (business, information, application, and technology), building the IT business case, IT project management, and change management.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 455 3 units; H(3-0) (formerly Management Informations Systems 455)

Business Technology Management Field Project
Student teams are assigned to organizations in Calgary and the surrounding area to solve specific information and technology issues. Teams investigate the issues and present proposed solutions to the organization contact. Teams will execute the approved project plan and present a final report both orally and in writing to the organization contact. The project may involve interviewing, library and Internet research, and data collection.

Prerequisite(s): Admission to the Haskayne School of Business, Business Technology Management 317 and one senior Business Technology Management course.

Corequisite(s): One other senior Business Technology Management course.

Business Technology Management 459 3 units; H(3-0) (formerly Management Information Systems 459)

Decision Support Application Development using VBA Programming
Students will work with Visual Basic for Applications (VBA) to create decision support systems and other applications across Microsoft Office Suite applications. Students will also learn how to use VBA skills to produce business applications. The focus of the course will be the creation of applications that will allow managers to make meaningful decisions using available data like financial and other industry data from both internal and external sources.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 461 3 units; H(3-0) (formerly Management Information Systems 461)

IT Platform Management
Technology background related to telecommunications, data communications and IT platforms. Technologies and management issues associated

with network models, networking, security and compliance, platform design and competition. Network planning design, integration, implementation, and operation including inter-organizational issues. Current and future issues in organizational implications of telecommunications and IT platform business technologies.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 463
3 units; H(3-0)
(formerly Management Information Systems 463)

Issues in Business Technology Management
Using an integrated learning approach, students are exposed to issues and emerging issues confronting both information systems managers and functional area managers, incorporating the customer point of view. Emphasis is on the managerial, organizational, and technological issues associated with effective and efficient use of information, technology resources, and IT platforms.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 465
3 units; H(3-0)
(formerly Management Information Systems 465)

Enterprise Systems
Students will explore the technologies and issues underlying enterprise systems, enterprise application integration, workflow systems, and information analytics. The focus is on strategic, managerial, and technical implications of the use of such systems in organizations. Students will examine the current managerial practices for enterprise system design, implementation, and usage.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 467
3 units; H(3-0)
(formerly Management Information Systems 467)

e-Business
Role, management and use of information technologies to enable a range of organizational and business relationships, models and strategies. Topics include developing an IT strategy; digital marketing; customer relationship management (CRM); supply chain management (SCM); planning, developing, and maintaining websites cloud computing; IT platforms; legal, privacy, and security issues; and information technologies for facilitating the use of data, knowledge, and multimedia.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

Business Technology Management 559
3 units; H(3-0)
(formerly Management Information Systems 559)

Selected Topics in Business Technology Management
Discussion of current or special interest topics in Business Technology Management from a managerial orientation.

Prerequisite(s): Admission to the Haskayne School of Business and Business Technology Management 317.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Business Technology Management 601
3 units; H(3-0)
(formerly Management Information Systems 601)

Business Technology Management
The fundamentals of how to use information technology (IT) innovatively to create competitive firms, to manage global interdependencies, and to provide and support quality products and services efficiently and effectively. Topics covered include trends in IT and how they may affect organizations, how organizations and the value chain can be redesigned using IT to encourage and facilitate better performance, how the Internet and electronic commerce impact organizations and markets, how IT-based platforms drive the network economy.

Business Technology Management 725
3 units; H(3-0)
(formerly Management Information Systems 725)

e-Business
The fundamental theories and practices in e-Business. Topic includes economic motivations for e-Business, the underlying information technologies and applications that enable e-Business, and e-Business strategies.

Prerequisite(s): Business Technology Management 601.

Business Technology Management 735
3 units; H(3-0)
(formerly Management Information Systems 735)

Enterprise Analysis
Course focus is on enterprise analysis and management of IT-enabled solutions to business problems. Emphasis is placed on problem identification, requirements determination, process analysis, enterprise architecture design and IT auditing using the COBIT framework.

Prerequisite(s): Business Technology Management 601.

Business Technology Management 737
3 units; H(3-0)
(formerly Management Information Systems 737)

Data Analytics
The course covers theories and applications of business intelligence (BI) and business analytics (BA). The focus is on data visualization, data analytics, web analytics, social media analytics, forecasting, and interpretation.

Prerequisite(s): Business Technology Management 601.

Business Technology Management 743
3 units; H(3-0)
(formerly Management Information Systems 743)

IT Platform Strategy
Basic characteristics of industries based on network and information goods. Topic includes platform-mediated networks, network effects, versioning, pricing, and compatibility. The course discusses these topics through analytical models and business cases.

Prerequisite(s): Business Technology Management 601.

Business Technology Management 797
3 units; H(3S-0)
(formerly Management Information Systems 797)

Advanced Seminar in Business Technology Management
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

PhD Course

Business Technology Management 799
3 units; H(3S-0)
(formerly Management Information Systems 799)

Doctoral Seminars in Business Technology Management
799.01. PhD Seminar I in Business Technology Management

799.02. PhD Seminar II in Business Technology Management

799.03. PhD Seminar III in Business Technology Management

799.04. PhD Seminar IV in Business Technology Management

Canadian Studies CNST

Instruction offered by the Department of History.

Junior Course

Canadian Studies 201 **3 units; H(3-0)**

Introduction to Canadian Studies
An interdisciplinary examination of the nature of Canadian nationalism and regionalism in their developmental and contemporary contexts. The political, economic and cultural dimensions of Canadian identity will be a central focus.

Senior Courses

Canadian Studies 333 **3 units; H(3-0)**

A Comparison of Canadian and American Cultures
An interdisciplinary comparison of Canadian and American cultures and cultural assumptions. A variety of issues and contexts will be dealt with from historical and contemporary perspectives.

Canadian Studies 337 **3 units; H(3-0)**

Introduction to Folklore: The Canadian Context
Introduction to the academic study of folklore: basic terminology, folk groups, performance and applications with examples taken from the Canadian and Albertan context. Introduction to traditional genres of folkloristic expression and analyses of current folk groups and their folklore.

Canadian Studies 339 **3 units; H(3-0)**

Canadian Humour and Culture
An examination and evaluation of the traditions and techniques of Canadian humour and humorists in a variety of media. Examples will be drawn from newspaper humorists, oral folk humour, legend, essays and other literary humour, animated and other films, radio and television, and political cartoons. Humour will be analyzed as a means of communicating cultural values, traditions, and mythology.

Canadian Studies 341 **3 units; H(3-0)**

Canadian Animation
The history, techniques, and themes of Canadian animation from the early days to the present. The relationship between animation and Canadian culture, including traditions, values, and motifs will be studied.

Canadian Studies 355 **3 units; H(3-0)**

Canadian Cities and Canadian Identity
Canadian urban life from an interdisciplinary perspective. The contribution of urban life to Canadian identity and to national, regional and provincial development and awareness.

Canadian Studies 361 **3 units; H(3-0)**

Gender, Race and Ethnicity in Canada
An interdisciplinary introduction to gender, race and ethnicity in Canada to provide an understanding of race, ethnicity and gender as simultaneous and intersecting systems of relationship and meaning.

Canadian Studies 401 **3 units; H(3-0)**

Special Topics in Canadian Studies
An examination of selected topics in Canadian Studies. See the Schedule of Classes for current topic(s).

MAY BE REPEATED FOR CREDIT

Canadian Studies 433 **3 units; H(3-0)**

The Arts and Popular Culture in Canada
An interdisciplinary study of cultural production in Canada, including both popular and fine arts. Topics may include the contribution of particular artists, arts organizations and institutions to Canadian Culture, as well as cultural industry formation, identity development through the arts, the impact of technology and globalization on cultural production, and Canadian cultural production in an international context.

Note: Students may be required to attend off-campus events outside of class time.

Canadian Studies 439 **3 units; H(3-0)**

Approaches to Canadian Heritage
Examines heritage commemoration, preservation and interpretation by involving students in support projects with local communities. Projects involve the exploration of presentation methods; the use of oral, artifactual and other evidence in heritage projects; policy and planning issues, the cultural, social, political, ecological and theoretical dimensions of heritage; and the sharing of heritage with the wider public.

Canadian Studies 451 **3 units; H(3-0)**

The Culture of the Calgary Stampede
A particular phenomenon of Calgary - and western Canadian culture - is the Calgary Stampede. In this interdisciplinary course, students will gain an understanding of the rich and complex history, vision and operation of this major western festival.

Antirequisite(s): Credit for Canadian Studies 451 and 401.05 will not be allowed

Note: Students may be required to attend off-campus events outside of class time (e.g. the Stampede grounds).

Canadian Studies 501 **3 units; H(3-0)**

Research in Selected Topics
Supervised individual study of a topic in Canadian Studies.

Prerequisite(s): Consent of the Department.

Note: Students should contact the Department of History at least two weeks prior to the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Canadian Studies 591 **3 units; H(3S-0)**

Senior Seminar in Canadian Studies
Advanced level seminar(s) in Canadian Studies, for examination of particular topics of special interest to senior students.

Prerequisite(s): Admission to the Canadian Studies Major program and 72 units (12.0 full-course equivalents), or consent of the Faculty.

Antirequisite(s): Credit for Canadian Studies 591 and 505 will not be allowed.

Cellular, Molecular and Microbial Biology CMMB

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.

†Note: Limited amounts of non-scheduled class time involvement will be required for this course.

Senior Courses

†Cellular, Molecular and Microbial Biology 343 **3 units; H(3-3)**

Microbiology
An introductory study of prokaryotes, viruses and immunology with emphasis on systematics, ecology, physiology, molecular biology and roles in pathogenesis of the major groups of prokaryotes.

Prerequisite(s): Chemistry 351 and one of Biology 231 or 243 or 311 or Medical Science 341.

Note: Prior completion of or concurrent registration in Biochemistry 393 and Chemistry 353 is strongly recommended.

Cellular, Molecular and Microbial Biology 403 **3 units; H(3-1T)**

Developmental Biology of Animals
Study of the mechanism of cellular differentiation with emphasis on intra- and intercellular processes.

Prerequisite(s): Biochemistry 393; and one of Biology 311 or Medical Science 341; plus one of Biology 331 or Medical Science 351.

Note: Enrolment in this course may be limited. See Enrolment Limitations in Courses in the Faculty of Science section of the Calendar.

Cellular, Molecular and Microbial Biology 411 **3 units; H(3-0)**

Molecular Genetics
Molecular biology and gene expression in prokaryotes and eukaryotes. Topics include: DNA topology, genome structure, chromatin structure, DNA replication, DNA repair and recombination, mechanisms of transcription and gene expression, post-transcriptional RNA processing, translation.

Prerequisite(s): One of Biology 311 or Medical Science 341; and one of Biology 331 or Medical Science 351.

Note: Prior completion of or concurrent registration in Biochemistry 401 or 443 is strongly recommended.

Cellular, Molecular and Microbial Biology 413 **3 units; H(3-0)**

Human Genetics
The principles of genetics as applied to human and medical genetics. Mendelian and multifactorial inheritance of normal and abnormal traits, pedigree analysis, segregation, linkage and gene mapping. Cytogenetics and developmental genetics. Population genetics including inbreeding and evolution in humans. Genetic predisposition to disease.

Prerequisite(s): Biology 311 or Medical Science 341.

Cellular, Molecular and Microbial Biology 421 **3 units; H(3-2T)**

Virology
Comprehensive overview of virus structure and replication; molecular events involved in virus infection and replication including genetics, biochemistry and molecular biology of bacterial, plant and animal viruses. Areas of persistent viruses, viral immunology, cancer and AIDS will be covered.

Prerequisite(s): Biochemistry 393 and Cellular, Molecular and Microbial Biology 343; and one of Biology 311 or Medical Science 341; as well as one of Biology 331 or Medical Science 351.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar. Prior completion of or concurrent registration in Biochemistry 401 or 443 is strongly recommended.

Cellular, Molecular and Microbial Biology 431 **3 units; H(3-0)**

Bacterial Pathogens
An introduction to microbes that cause infections (in humans, other animals and plants.) Topics include: the relationship between pathogen and host, ability of pathogens to colonize, reproduce and cause disease, the role of antibiotics and vaccines in treatment and prevention of infection, antibiotic resistance in bacteria, environmental control of virulence factor production.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343.

Cellular, Molecular and Microbial Biology 443 **3 units; H(3-3)**

Microbial Physiology
The focus is structure and function of prokaryotic cells. Topics include cell envelope structure, cell division, transport and secretion, signal transduction, differentiation and development, bacterial growth and energetics, and the diversity of metabolic pathways in Bacteria and Archaea. The laboratory introduces analytical techniques commonly used in bacterial physiology, and some useful biochemical assays.

Prerequisite(s): Biochemistry 393 and Cellular, Molecular and Microbial Biology 343.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Cellular, Molecular and Microbial Biology 451
3 units; H(3-5)

Molecular Analysis of Biological Systems
A laboratory course emphasizing techniques in molecular biology that can be applied to the analysis of problems in cellular, molecular and microbial biology.

Prerequisite(s): Cellular, Molecular and Microbial Biology 411 and admission to the Cellular, Molecular and Microbial Biology major or to the Biological Sciences Honours program.

Antirequisite(s): Credit for Cellular, Molecular and Microbial Biology 451 and either Biochemistry 401 or 541 will not be allowed.

Cellular, Molecular and Microbial Biology 461
3 units; H(3-0)
(formerly Biology 461)

Functional Genomics and Molecular Networks
Introduction to high-throughput methods for global functional and network analysis of genes and proteins. Topics include microarrays, chromatin immunoprecipitation, synthetic genetic array analysis, next-generation sequencing and network topology.

Prerequisite(s): Biology 331.

Cellular, Molecular and Microbial Biology 505
3 units; H(3-0)

Advanced Developmental Biology
In-depth analyses of the current literature in developmental biology. Emphasis will be on the co-ordinated regulation of gene expression during development.

Prerequisite(s): Cellular, Molecular and Microbial Biology 403.

Cellular, Molecular and Microbial Biology 507
3 units; H(0-8) or H(3-0)

Special Problems in Cellular, Molecular and Microbial Biology
Independent Research or reading project that may include seminars, lectures, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 54 units (9.0 full-course equivalents) and consent of the Department.

MAY BE REPEATED FOR CREDIT

Cellular, Molecular and Microbial Biology 511
3 units; H(3-0)

Molecular Biology and Genetics
The concepts of molecular biology as they apply to genetics. Application of current methodology to the understanding of the genetics of prokaryotes, lower and higher eukaryotes (for example: fungi, yeasts, trypanosomes, plants and animals). Genomic organization and function of subcellular organelles such as mitochondria and chloroplasts will also be considered in detail. The mechanism(s) of regulation of gene expression will be discussed in relation to nuclear as well as organelle genomes.

Prerequisite(s): Cellular, Molecular and Microbial Biology 411.

Cellular, Molecular and Microbial Biology 519
3 units; H(3-0)

Advanced Cell Biology
In-depth analysis of current literature in cell biology. Topics include subcellular organization and dynamics, cell signalling and differentiation, protein and RNA trafficking, and other aspects of eukaryotic cell biology.

Prerequisite(s): Biology 311 and 331 and one of Biochemistry 401 or 443.

Cellular, Molecular and Microbial Biology 523
3 units; H(3-0)

DNA Genomes and RNA Function
An examination of information storage and gene expression in prokaryotes and eukaryotes. Biochemical mechanisms of gene expression and regulation in bacteria. Genome sequencing projects and a survey of genome structure and content across domains of life. Topics in eukaryotic gene expression. The diverse roles played by RNA, from information molecules to structural scaffolds to ribozymes.

Prerequisite(s): Cellular, Molecular and Microbial Biology 411.

Cellular, Molecular and Microbial Biology 527
3 units; H(3-3)

Immunology
Comprehensive overview of the immune system and how immune responses are generated and regulated in the context of infectious diseases. Topics include both fundamental cellular and molecular immunology. Dysregulated responses, such as autoimmunity, immunodeficiencies, transplants, and allergies will also be covered.

Prerequisite(s): Biology 311 and 331 and Cellular, Molecular and Microbial Biology 343 and one of Biochemistry 401 or 443.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Cellular, Molecular and Microbial Biology 528
6 units; F(0-8)

Independent Studies in Cellular, Molecular and Microbial Biology
Original and independent thought, practical research and the completion of written and oral reports.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

MAY BE REPEATED FOR CREDIT

Cellular, Molecular and Microbial Biology 530
6 units; F(0-8)

Honours Research Project in Cellular, Molecular and Microbial Biology
Research project under the direction of one or more faculty members in the Department of Biological Sciences. Formal written and oral reports must be presented on completion of this course. Open only to Honours Cellular, Molecular and Microbial Biology students or Honours Biological Sciences students.

Prerequisite(s): Cellular, Molecular and Microbial Biology 451 and completion of at least 90 units (15 full-course equivalents) and consent of the Department.

Cellular, Molecular and Microbial Biology 531
3 units; H(3-0)

Topics in Cellular Interactions
An exploration of selected topics concerning cell-cell interactions and the interactions of cells with their environment during development, differentiation and disease (cancer). Multidisciplinary approaches will be presented, using discussions of seminal research and critical analysis of current literature. Potential topics include cell junctions, cell signaling, cytoskeletal organization, stroma, extracellular matrix remodelling and stem cells and cancer stem cells.

Prerequisite(s): Biology 331 and one of Biochemistry 401 or 443 or 431.

Cellular, Molecular and Microbial Biology 543
3 units; H(3-0)

Environmental Microbiology
Focuses on understanding the interactions of micro-organisms with their environment. Roles of micro-organisms in nutrient cycling, biological control, and biodegradation will be discussed. The use of molecular approaches to identify and characterize microbial communities, and to understand the precise nature of microbial interactions with abiotic and biotic environments will be emphasized. Special topics will include plant-microbe and animal-microbe symbiosis, extreme environments and biotechnological applications of environmental microbiology.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343.

Cellular, Molecular and Microbial Biology 545
3 units; H(3-0)

Petroleum Microbiology
Microorganisms can contribute to a more sustainable energy future. Their impact and roles in the fossil fuel industry will be reviewed. Topics will include oilfield souring, biocorrosion, biodegradation, enhanced recovery, upgrading, and bioremediation of contaminated sites.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343.

Cellular, Molecular and Microbial Biology 549
3 units; H(3-0)

Microbial Genetics
The genetics and genomics of prokaryotes. Topics will include recombination, mechanisms of genetic exchange, analysis of genes and genomes, and genome evolution. Selected current topics in bacterial genetics will also be covered.

Prerequisite(s): Cellular, Molecular and Microbial Biology 411.

Cellular, Molecular and Microbial Biology 561
3 units; H(3-0)
(Medical Science 561)

Cancer Biology
Advances in methodology and in theoretical concepts have permitted continuing breakthroughs in our understanding of the organismal, cellular and molecular biology of cancer cells, and in the development of novel strategies for cancer prevention, diagnosis and treatment. These advances will be presented in a comprehensive overview of cancer including issues of demographics and incidence, causation and detection, origins and progression and therapeutic approaches. Emphasis will be placed on the cell and molecular biology of cancer and on the interaction of the cancer cell with the host organism.

Prerequisite(s): Biology 331 and Cellular, Molecular and Microbial Biology 411 and one of Biochemistry 401 or 443.

Cellular, Molecular and Microbial Biology 563
3 units; H(3-0)

Microbial Diversity
An overview of microbial diversity, the evolutionary mechanisms that give rise to it, and the methods used to study it. Topics may include: microbial systematics; characterizing the last universal common ancestor of life; estimating global microbial diversity; "unculturable" microbes and molecular DNA-based methods used to study them in nature; modern cultivation techniques; comparative genomics of microbial species; environmental

metagenomics; microbial biogeography and speciation and gene flow in microbial communities.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343.

Cellular, Molecular and Microbial Biology 565 3 units; H(3-0)

(Medical Science 565)

Advanced Topics In Pathogenic Microbiology
Provides a fuller understanding of bacterial diseases using a systems approach and illustrating key paradigms via the consideration of specific pathogens. Topics include: strategies for bacteria surviving host immune responses, bacterial invasion strategies, opportunistic infections, disease Pathogenesis, and antibiotic resistance, challenges of dealing with emerging infections. Lectures, small group interactive sessions, specified readings.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343 and 431.

Cellular, Molecular and Microbial Biology 567 3 units; H(3-0)

(Medical Science 567)

Advanced Topics In Immunology
New and emerging themes in immunology, with an emphasis on disease processes such as inflammation in the gut, kidney and lung. Topics include: innate immunity, the inflammasome, sterile inflammation, process and mechanism of immune cell recruitment in different tissues, T cell biology, B cell biology, regulatory immune cells, mucosal immunity, airways responses to virus, mechanisms of food allergies, inflammatory bowel disease. Lectures, small group interactive sessions, specified readings.

Prerequisite(s): Cellular, Molecular and Microbial Biology 527 or Medical Science 321.

Graduate Course

Enrolment in any graduate course requires consent of the Department.

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

600-level courses are available with permission to undergraduate students in the final year of their programs.

Cellular, Molecular and Microbial Biology 637 3 units; H(3-0)

Advanced Topics in Molecular Microbiology
Techniques and discussion of recent literature in molecular microbiology. Topics covered will vary from year to year, but could include bioinformatics, genomics, mutagenesis, advanced microscopy techniques, proteomics, vectors and cloning techniques, gene expression, and over-expression of proteins, as they relate to the study of prokaryotic systems. Course content will be tailored to the interests of the graduate students enrolled in the class in a given year.

Central and East European Studies CEST

Instruction offered by the Faculty of Arts.

Senior Course

Central and East European Studies 313 3 units; H(3-0)

An Introduction to Cultural Traditions
A survey of Russian and Eastern European cultural history from the settlement of the Slavic peoples to the early twentieth century. Included will be such topics as the ethnic, linguistic, and cultural composition of the region; art and architecture of medieval Russia; the Enlightenment; national revival movements; literature, music and painting; modernism; the cultural efflorescence of the early Soviet period.

Prerequisite(s): Consent of the Centre for International Students and Study Abroad.

Antirequisite(s): Credit for Central and East European Studies 313 and History 493.19 will not be allowed.

Note: Normally taught as part of the Term Abroad Program.

Chemical Engineering ENCH

Instruction offered by members of the Department of Chemical and Petroleum Engineering in the Schulich School of Engineering.

Senior Courses

Chemical Engineering 315 3 units; H(3-1)

Chemical Engineering Process Calculation
Material and energy balances of physical and chemical systems for steady state and transient conditions. Introduction to analysis and synthesis of chemical processes.

Corequisite(s): Engineering 311.

Chemical Engineering 331 3 units; H(3-1T-3/2)

Process Fluid Dynamics
Fluid Properties; Newtonian and non-Newtonian fluids. Fluid statics. Bernoulli equation; derivation and applications. Control volume and system representation. Differential analysis of Flows. The Navier-Stokes equation; applications. Dimensional analysis. Flow in conduits; laminar and turbulent flows; single-pipe and multiple-pipe systems. Forces on immersed bodies; fluidization. Metering.

Prerequisite(s): Engineering 201 and 202; and Mathematics 277 or Applied Mathematics 219; and Mathematics 375 or Applied Mathematics 307.

Chemical Engineering 401 3 units; H(3-1)

Analyses of Chemical, Oil and Gas Engineering Processes
Partial differential equations in different co-ordinate systems. Approximate and exact methods of solving equations. Similarity transform, Separation of variables. Laplace transform. Fourier series and Sturm-Liouville systems. Analysis and solution of steady state and transient diffusion problems including Fourier, Darcy and Fick's law analogies. Application to energy transfer in solids and pressure propagation in reservoirs.

Prerequisite(s): Chemical Engineering 331 and Mathematics 375 or Applied Mathematics 307.

Corequisite(s): Chemical Engineering 403.

Chemical Engineering 403 3 units; H(3-1T-4/2)

Heat Transfer
A study of concepts involved in heat transfer. Applications of continuity and energy equations. Boundary layer theory. Conduction, convection and radiation heat transfer. Boiling and condensation. Evaporation. Heat exchanger calculations.

Prerequisite(s): Mathematics 375 or Applied Mathematics 307 and Chemical Engineering 331.

Chemical Engineering 405 3 units; H(3-1)

Separation Processes I
Diffusion and convective mass transfer. Staged and continuous contacting. Solid-liquid and liquid-liquid extraction, distillation, absorption and stripping.

Prerequisite(s): Chemical Engineering 403 and 427.

Chemical Engineering 407 3 units; H(3-2T)

Numerical Methods in Chemical and Oil & Gas Engineering
The theory and use of numerical computational procedures to solve chemical and oil and gas engineering problems. Methods for solution of nonlinear equations, solution of simultaneous linear equations, regression, curve fitting, solution of the algebraic eigenvalue problem, interpolation, differentiation, integration, solution of ordinary differential equations and partial differential equations are included.

Prerequisite(s): Engineering 233 and Mathematics 375 or Applied Mathematics 307.

Antirequisite(s): Credit for Chemical Engineering 407 and Engineering 407 will not be allowed.

Chemical Engineering 421 3 units; H(3-1)

Chemical Engineering Kinetics
Kinetics of homogeneous reactions and the interpretation of kinetic data; design of single and multiple reactors for simple, simultaneous and consecutive reactions; influence of temperature, pressure and flow on reactions and reactor design; introduction to heterogeneous reaction systems and catalyzed fluid reactions.

Prerequisite(s): Chemical Engineering 403 and Chemistry 357.

Corequisite(s): Chemical Engineering 405.

Chemical Engineering 423 3 units; H(3-1)

Chemical Engineering Process Development
Design of chemical processing units and plants; cost estimates and chemical process economics; optimization techniques; introduction to linear programming. Safety and environmental considerations in process design.

Prerequisite(s): Chemical Engineering 315.

Antirequisite(s): Credit for Chemical Engineering 423 and Petroleum Engineering 423 will not be allowed.

Chemical Engineering 427 3 units; H(3-1T-1)

Chemical Engineering Thermodynamics
Review of first and second law principles; application to the properties of fluids and solutions; vapour liquid equilibria; the third law; applications to chemical equilibrium and chemical reactions.

Prerequisite(s): Engineering 311 and Chemical Engineering 315.

Chemical Engineering 429 3 units; H(3-2T-3/2)

Process Dynamics and Control
Mathematical models describing transient response characteristics of basic process elements; use of a dynamic process simulator; block flow diagram of a feedback control loop; process control hardware; basic control modes; tuning feedback controls; cascade control; feedforward control; common control loops; distillation column control; design of multiple single loop controllers; plant wide modelling and control.

Prerequisite(s): Chemical Engineering 315 and Mathematics 375.

Corequisite(s): Chemical Engineering 405.

Antirequisite(s): Credit for Chemical Engineering 429 and 529 will not be allowed.

Chemical Engineering 501 3 units; H(3-1T-1)

Transport Phenomena
Simplification, scaling and dimensional reasoning. Error estimation. Heat, mass and momentum transfer analyses. Convective-Diffusive transport in open and porous media. Systems and process modelling. Analytical solutions by the lumped, integral and differential techniques.

Prerequisite(s): Chemical Engineering 401.

Chemical Engineering 503 3 units; H(3-1T)

Crude Oil Upgrading and Refining
Upgrading objectives; analysis and composition of non-distillable material and its relationship to upgrading; upgrading processes; refinery products and specifications. Conventional, heavy oil and bitumen upgrading technology.

Prerequisite(s): Third-year standing, or higher, in Chemical Engineering or Oil and Gas Engineering.

Chemical Engineering 505 3 units; H(3-1T-1)

Separation Processes II
Concepts in mass transfer including molecular diffusion, mass transfer rates, and mass transfer coefficients. Application of these and other fundamental concepts in chemical engineering to develop process design specifications for various unit operations which may include: crystallization, humidification and cooling, drying, adsorption, and membrane processes.

Prerequisite(s): Chemical Engineering 405.

Chemical Engineering 511 3 units; H(3-4)

Chemical Process Design I
Team design project applying principles of process engineering and project management; Gantt charts; critical path method; process simulation, degrees of freedom analysis; considerations in process selection; plant location; block flow diagrams; process flow diagrams; short cut process equipment design/sizing procedures; preliminary equipment cost estimating techniques.

Prerequisite(s): Chemical Engineering 405, 421, 423 and 429.

Antirequisite(s): Credit for Chemical Engineering 511 and Petroleum Engineering 511 will not be allowed.

Note: Restricted to Chemical Engineering students only. Consent of department required for non-University of Calgary students.

Chemical Engineering 519 3 units; H(3-1T)

Special Topics
Current advanced topics in Chemical Engineering.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Chemical Engineering 530 3 units; H(3-1T)

Electrochemical Engineering
Electrochemical kinetics and thermodynamics. Mass transport in electrochemical cells. Design and modelling of electrochemical cells. Application of electrochemistry to fuel cells, batteries, and water treatment.

Antirequisite(s): Credit for Chemical Engineering 530 and any of 519.13, 519.14 or 651 will not be allowed.

Chemical Engineering 531 3 units; H(2-6)

Chemical Process Design II
Team design project continuing from Chemical Engineering 511. Detailed design of large commercial plants involving the preparation of a process and instrumentation diagram; emphasis on computer design procedures; specification sheets for chemical processing equipment such as separators, pumps, compressors, columns and process piping. Other topics include operational considerations in design, plant safety; relief system design; waste treatment and pollution control processes; plant and equipment plot plans; control and computer simulation.

Prerequisite(s): Chemical Engineering 511.

Chemical Engineering 535 3 units; H(3-2/2)

Principles of Biochemical Engineering
Introduction to biochemistry, enzyme kinetics and cell growth and metabolism. Aspects of mass transfer, heat transfer and fluid flow related to the design of biological process equipment. Fermentations, sterilization and extraction techniques. Treatment of effluents. Introduction to bio-reactor design and scale-up. Introduction to process instrumentation and control.

Prerequisite(s): Chemistry 357.

Chemical Engineering 537 3 units; H(3-1T)

Computational Thermodynamics
Amalgamation of thermodynamic models and computational techniques with application to industrially important thermodynamic problems such as multi-component flash calculations, reacting systems, phase stability and gas hydrates.

Prerequisite(s): Chemical Engineering 427.

Chemical Engineering 539 3 units; H(3-1T)

Polymer Engineering
Introduction to polymer science and technology. Molecular structure, processing, rheology, thermal, physical and mechanical properties. Synthetic polymers used in biomedical, manufacturing and other advanced technological applications.

Prerequisite(s): Chemical Engineering 403.

Corequisite(s): Prerequisite or Corequisite: Chemistry 357.

Chemical Engineering 551 3 units; H(1-4/2)

Chemical Engineering Laboratory
Experiments which demonstrate the operation of chemical process equipment involving heat and/or mass transfer, or kinetics. Lectures will cover experimental design and applied statistics.

Prerequisite(s): Chemical Engineering 405.

Corequisite(s): Chemical Engineering 505 or Biomedical Engineering 500 or 501.

Antirequisite(s): Credit for Chemical Engineering 551 and Petroleum Engineering 551 will not be allowed.

Graduate Courses

Chemical Engineering 607 3 units; H(3-0)

Natural Gas Processing Principles
Physical and chemical properties of natural gases; vapour-liquid equilibrium data and computations; flow of gas and gas-liquid mixtures; separation of gaseous mixtures; heat transfer in gas processing; production of natural gas and its associated liquids.

Note: This course does not count towards the degree requirements of MSc and PhD students.

Chemical Engineering 609 3 units; H(3-0)

Natural Gas Processing Technology
Design and operational criteria in transporting and processing of natural gas; refrigeration and compression; cryogenics; hydrocarbon dew point control; LPG recovery; sulphur recovery; mechanical flow diagrams; process simulation.

Prerequisite(s): Chemical Engineering 607 or an undergraduate degree in Chemical Engineering.

Chemical Engineering 613 3 units; H(3-0)

Advanced Topics in Mass Transfer
Advanced concepts in mass transfer in multiphase systems. Mass transfer with simultaneous chemical reaction and heat transfer.

Chemical Engineering 615 3 units; H(3-1.5)

Model Predictive Control
Review of process dynamics and control fundamentals (step response curves, PID control structures and PID controller tuning). Identification of finite impulse response models from plant data. Model Predictive Control (MPC) algorithms (e.g. Dynamic Matrix Control). Applications of Linear Programming to determine optimal MPC setpoints respecting unit constraints. Computer simulation using the MATLAB MPC toolbox. Introduction to univariate controller performance assessment techniques.

Chemical Engineering 617 3 units; H(3-1.5)

Modelling and Identification Advanced Control
First-principles dynamic models of complex chemical processes. Comparison of dynamic simulation models generated using MATLAB/Simulink with those imbedded in commercial process simulators. Consideration of operability in plant design. Introduction to time series analysis and closed-loop identification. Causality versus correlation. Multivariate regression methods for soft sensor design.

Chemical Engineering 619 3 units; H(3-0)

Special Problems
Advanced studies on specialized topics in chemical, petroleum, biochemical and environmental engineering.

MAY BE REPEATED FOR CREDIT

Chemical Engineering 620 6 units; F(0-4)

Graduate Project
Individual project in the student's area of specialization under the guidance of a faculty member. A written proposal, one or more written progress reports, and a final written report are required. An oral presentation is required upon completion of the course. Open only to students in the MEng (course-based) program.

Prerequisite(s): Consent of the Department Head or Associate Head Graduate Studies.

Antirequisite(s): Credit for Chemical Engineering 620 and 699 will not be allowed.

Chemical Engineering 621 3 units; H(3-0)

Reservoir Simulation
Enhanced recovery modelling (generalized black-oil models, compositional and miscible), well treatment, grid orientation. New developments in gridding, thermal models, naturally fractured reservoirs, modelling of induced fractures (hydraulic and waterflood), reservoir geomechanics, and practical aspects of conducting simulation studies.

Prerequisite(s): Petroleum Engineering 429 or 523.

Chemical Engineering 623 3 units; H(3-0)

Chemical Reactor Design
Advanced study of design and operation of chemical reactors for both homogeneous and heterogeneous systems, batch, continuous flow stirred tank, tubular and multibed adiabatic reactors. Cold shot cooling in reactors. Optimal temperature

gradients and yields. Catalyst effectiveness factors and optimal control with decaying catalysts. Analysis of sulphur plant reactor design including cost optimization.

Prerequisite(s): Chemical Engineering 421.

Chemical Engineering 625 3 units; H(3-0)

Advanced Topics in Heat Transfer
Diffusive and convective transport of heat. Analytical and approximate solutions to steady state and transient conduction and convection problems. Superposition techniques. Forced convection of heat in laminar and turbulent regimes.

Chemical Engineering 627 3 units; H(3-1.5)

Chemical Process Simulation
Object oriented programming applied to the design of a steady state chemical process simulator via the sequential modular approach and by the equation-based approach. Material and energy balances for systems of process units.

Chemical Engineering 629 3 units; H(3-0)

Secondary and Tertiary Recovery
Displacement processes for improved recovery of hydrocarbons. Waterflooding, gas flooding, solvent flooding and chemical flooding. Performance prediction techniques. Comparative economics.

Prerequisite(s): Petroleum Engineering 525.

Chemical Engineering 630 3 units; H(3-1T)

Electrochemical Engineering
Electrochemical kinetics and thermodynamics. Mass transport in electrochemical cells. Design and modelling of electrochemical cells. Application of electrochemistry to fuel cells, batteries, and water treatment.

Antirequisite(s): Credit for Chemical Engineering 630 and any of 519.13, 519.14 or 651 will not be allowed.

Chemical Engineering 631 3 units; H(3-0)

Advanced Topics in Fluid Mechanics
Constitutive equations for viscous flow and methods of solution. Laminar, transition and turbulent flows. Hydrodynamic stability. Vortices. Boundary layers.

Chemical Engineering 633 3 units; H(3-0)

Chemical Thermodynamics
Advanced application of thermodynamic principles. Calculation of thermodynamic properties; ideal and non-ideal solution theory; calculation of phase equilibria; properties of reacting mixtures.

Prerequisite(s): Chemical Engineering 427.

Chemical Engineering 639 3 units; H(3-0)

Applied Numerical Methods in Engineering
Numerical solution of systems of linear and non-linear algebraic equations, eigenvalue problems. Numerical solution of systems of ordinary and partial differential equations. Initial value and boundary value problems. Finite difference and finites element methods. Numerical stability.

Note: Knowledge of a programming language and undergraduate-level numerical methods is necessary.

Chemical Engineering 643 3 units; H(3-0)
(Environmental Engineering 641)

Air Pollution Control Engineering
Introduction to air quality and air pollution. Energy and air pollution. Fossil fuel combustion and related air pollution. Industrial air pollution control. Control of particulate matter. Control of VOCs, SOx, and NOx. Adsorption, absorption and biofiltration of air pollutants. GHG emission control. Recent advances on related topics.

Antirequisite(s): Credit for Chemical Engineering 643 and Environmental Engineering 641 will not be allowed.

Chemical Engineering 645 3 units; H(3-0)
(Environmental Engineering 661)

Industrial and Produced Wastewater Treatment
Sources and characterization of industrial wastewater. Treatment objectives and regulations. Unit and process design. Physical/chemical treatment including sedimentation, coagulation, filtration, absorption, adsorption, ion exchange, membrane processes and pH adjustment.

Note: Credit for Chemical Engineering 645 and Environmental Engineering 661 will not be allowed.

Chemical Engineering 647 3 units; H(3-0)

Thermal Recovery Methods
Oil sands and heavy oil resources. Fluid and rock properties. Heat transfer processes in porous media. Comparative analysis of viscous oil recovery methods: steam flooding, cyclic steam stimulation, in-situ combustion and steam-assisted-gravity-drainage. Surface equipment and operation. Laboratory and field performance evaluation of thermal recovery methods. Process economics.

Prerequisite(s): Petroleum Engineering 429 or 523.

Chemical Engineering 649 3 units; H(3-0)

Naturally Fractured Reservoirs
Classification and characterization of naturally fractured reservoirs. Drilling and completion methods. Production characteristics. Tight gas reservoirs. Reserve estimation. Emphasis is placed on the relationship between geology, log interpretation, well testing, and primary-secondary recovery of hydrocarbons from naturally fractured reservoirs.

Chemical Engineering 653 3 units; H(3-0)

Horizontal Wells for Petroleum Production
Drilling and completion methods for horizontal wells; mathematical analysis of steady state flow to horizontal wells and well combinations; pseudo steady state and constant well bore pressure models; theoretical comparisons of predicted performance and coning behaviour of horizontal and vertical well patterns; performance in fractured reservoirs; potential for horizontal wells in heavy oil and bitumen production; basic conceptual ideas of steam-assisted gravity drainage.

Prerequisite(s): Petroleum Engineering 429 or Petroleum Engineering 523.

Chemical Engineering 657 3 units; H(3-0)

Advanced Reservoir Engineering
Formulation and solution of reservoir-engineering problems including combination of variables, Laplace transform, approximate Integral methods, and solution methods of moving boundary problems. Examples from thermal processes (e.g. hot waterflooding, SAGD), different recovery mechanisms (e.g. imbibition, expansion drive, solution-gas drive), well testing problems and naturally fractured reservoirs.

Prerequisite(s): Petroleum Engineering 429 or Petroleum Engineering 523.

Note: Prior knowledge of reservoir engineering and analytical solution methods of differential equations is necessary.

Chemical Engineering 659 3 units; H(3-0)

Advanced Cell and Tissue Engineering
Current challenges in tissue engineering. Focus on specific tissues. Course topics include a brief biology review, cell fate processes, stem cells, tissue microenvironments and mass transfer, biomaterials, bioreactors, and clinical delivery of tissue engineered constructs.

Prerequisite(s): Consent of the Department.

Note: Credit for Chemical Engineering 659 and Biomedical Engineering 619.06 will not be allowed.

Chemical Engineering 661 3 units; H(3-0)

Geostatistics for Reservoir Characterization
Statistical/probability concepts, exploratory data analysis, spatial structural analysis, estimation theory (Kriging), integration of auxiliary information and conditional stochastic simulation. Special emphasis on reservoir characterization and the particular problems encountered in that area. The geostatistical methodology for reservoir characterization will be demonstrated on a fluvial reservoir example.

Prerequisite(s): Petroleum Engineering 429 or Petroleum Engineering 523.

Note: Open to graduate Chemical Engineering, Civil Engineering and Geophysics students, and Geology graduate students with sound quantitative skills. Prior exposure to statistical/probability theory is required.

Chemical Engineering 665 3 units; H(3-0)
(Environmental Engineering 665)

Wastewater Issues for the Oil and Gas Industry
Produced water characteristics, regulations governing produced water management, management options. Technologies used for produced water treatment, novel/emerging technologies. Process design approaches and comparative evaluation of various technologies. Case Studies.

Note: Credit for Chemical Engineering 665 and Environmental Engineering 665 will not be allowed.

Chemical Engineering 677 3 units; H(3-0)

Advanced Topics in Oil and Gas Production
Problems related to production of conventional oil, heavy oil and natural gas; analysis of the interactions of oil, water and gas, effects of fluid properties, rock structure and capillary, gravity and viscous forces acting on the reservoir system; application to the design of improved oil and gas recovery methods. New processes in oil and gas recovery.

Prerequisite(s): Petroleum Engineering 429 or Petroleum Engineering 523.

Chemical Engineering 687 3 units; H(3-0)
(formerly Chemical Engineering 619.87)

Petroleum Economics
Economic principles and risk management practices in the petroleum industry. Project selection; investment ranking; budgeting; and portfolio development. Decision making under uncertainty and risk.

Chemical Engineering 689 3 units; H(3-0)

Drilling Advances, Modelling and Simulation
Application of drilling optimization simulator tools to optimize rate of penetration and minimize cost. Drilling hydraulics simulation, directional drill string torque and drag calculations, drilling fluid selection and analysis and real time drilling rate analysis.

Antirequisite(s): Credit for Chemical Engineering 689 and 619.91 will not be allowed.

Chemical Engineering 698 6 units; F(3-0)
(Geology 698) (formerly Chemical Engineering 619.95 and 619.96)

Reservoir Characterization for Field Development
A team-based, integrated reservoir description experience working with geophysical, geological, petrophysical, and engineering data to produce a field development plan.

Prerequisite(s): Chemical Engineering 621, Geology 697 and Human Resources and Organizational Dynamics 789.

Note: This course is intended for graduate students in the Master of Engineering with Reservoir Characterization Specialization.

Chemical Engineering 699 3 units; H(0-4)

Special Project
Project study conducted under the guidance of a faculty member and intended to expose the student to the tools, techniques and basic aspects of research. A written comprehensive report and one or more written progress reports are required.

Prerequisite(s): Consent of the Department Head or Associate Head Graduate Studies.

Antirequisite(s): Credit for Chemical Engineering 699 and 620 will not be allowed.

MAY BE REPEATED FOR CREDIT

Chemical Engineering 701 3 units; H(3-0)
(Environmental Engineering 621)

Experimental Design and Error Analysis
Statistical analysis and design of engineering experiments. Random variables and sampling distributions; estimation and hypothesis testing; concepts of central tendency, variability, confidence level; correlation, regression and variation analysis; robust estimation; experiments of evaluation; experiments of comparison; factorial experiments (analysis of variance); experimental designs (involving randomization, replication, blocking and analysis of covariance).

Antirequisite(s): Credit for more than one of Chemical Engineering 701, Environmental Engineering 621, Chemical Engineering 619.45 and 619.82 will not be allowed.

Note: Intended for MSc/PhD students. MEng students may be able to register with Instructor's Permission.

Chemical Engineering 703 3 units; H(3-0)

Advanced Mathematical Methods in Engineering
Review of theory of linear algebra. Review of ordinary differential equations: linear, non-linear; series solutions; special exact solutions; applications. Partial differential equations: geometric interpretation; characteristic curves; separation of variables; the Sturm-Liouville problem and Fourier series; eigenfunction expansion; Fourier, Laplace and Hankel transforms; self-similarity; Green's function; applications.

Antirequisite(s): Credit for Chemical Engineering 703 and 619.83 will not be allowed.

Note: Intended for MSc/PhD students. MEng students may be able to register with Instructor's Permission.

Chemistry CHEM

Instruction offered by members of the Department of Chemistry in the Faculty of Science.

Students interested in taking Chemistry courses are urged to read the advice in the Faculty of Science Program section of this Calendar. Students taking Chemistry courses which have a laboratory component are required to provide evidence that they have successfully completed the Chemical Laboratory Safety Course for Undergraduates prior to the first laboratory class. Students who have not completed this course at some time during their undergraduate program will not be allowed into the laboratory until they do so. Information about this course is available from the Chemistry Undergraduate Office (SA 229), email address: chem.undergrad@ucalgary.ca, or at ucalgary.ca/chem/.

Junior Courses

Chemistry 201 3 units; H(3-.75T-3/2)

General Chemistry: Structure and Bonding
An introduction to university chemistry from theoretical and practical perspectives, that focuses on an exploration of the fundamental links between electronic structure, chemical bonding, molecular structure and the interactions of molecules using inorganic and organic examples.

Prerequisite(s): Chemistry 30 (or Continuing Education - Introduction to Chemistry) and one of Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Mathematics 31 is strongly recommended.

Antirequisite(s): Credit for Chemistry 201 and any of 209, 211 or 301 will not be allowed.

Note: Chemistry 201 is not a prerequisite for Chemistry 203. Chemistry 201 and Chemistry 203 may be taken in any order. Students who have completed the International Baccalaureate Higher Level examination in Chemistry may request advanced credit in Chemistry 201 and 203. Those who have completed the Subsidiary Level examination in Chemistry may apply to the Department of Chemistry for advanced placement in Chemistry 201.

Chemistry 203 3 units; H(3-.75T-3/2)

General Chemistry: Change and Equilibrium
An introduction to university chemistry from theoretical and practical perspectives that focuses on an exploration of the fundamental links between kinetics, equilibria and thermodynamics and explores acidity/basicity and redox behaviour using inorganic and organic examples.

Prerequisite(s): Chemistry 30 (or Continuing Education - Introduction to Chemistry) and one of Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Mathematics 31 is strongly recommended.

Antirequisite(s): Credit for Chemistry 203 and any of 209, 213 or 301 will not be allowed.

Note: Chemistry 201 is not a prerequisite for Chemistry 203. Chemistry 201 and 203 may be taken in any order. Students who have completed the International Baccalaureate Higher Level examination in Chemistry may request advanced credit in Chemistry 201 and 203. Those who have completed the Subsidiary Level examination in Chemistry may apply to the Department of Chemistry for advanced placement in Chemistry 201.

Chemistry 209 3 units; H(3-1T-3/2)

General Chemistry for Engineers
Basic chemical concepts. Atomic and molecular structure. Chemical bonding. Chemical kinetics and equilibria. Acid-base and solubility equilibria. Oxidation-reduction phenomena and electrochemistry. The chemistry of water. The chemistry of energy sources. Basic environmental issues.

Prerequisite(s): Chemistry 30 (or Continuing Education - Introduction to Chemistry) and one of Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Mathematics 31 is strongly recommended.

Antirequisite(s): Credit for Chemistry 209 and any of 201, 203, 211, 213 and 301 will not be allowed.

Chemistry 211 3 units; H(3-3)

Foundations of Chemistry: Structure and Bonding
Same core topics as Chemistry 201 but taught with a greater emphasis on critical thinking, scientific observation and problem solving and the application of chemistry to topics such as drug design and environmental issues.

Prerequisite(s): Chemistry 30 (or Continuing Education - Introduction to Chemistry) and one of Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Mathematics 31 is strongly recommended.

Antirequisite(s): Credit for Chemistry 211 and any of 201, 209 or 301 will not be allowed.

Note: Strongly recommended for students majoring in Chemistry and other students with strong backgrounds in chemistry. Students who have completed the International Baccalaureate Higher Level examination in Chemistry may request advanced credit in Chemistry 211. Those who have completed the Subsidiary Level examination in Chemistry may apply to the Department of Chemistry for advanced placement in Chemistry 211.

Chemistry 213 3 units; H(3-3)

Foundations of Chemistry: Change and Equilibrium
Same core topics as Chemistry 203 but taught with a greater emphasis on critical thinking, scientific observation and problem solving and the application of chemistry to topics such as materials, explosives and medicine.

Prerequisite(s): Chemistry 201 or 211.

Antirequisite(s): Credit for Chemistry 213 and any of 203, 209 or 301 will not be allowed.

Note: Strongly recommended for students majoring in Chemistry and other students with strong backgrounds in chemistry. Students who have completed the International Baccalaureate Higher Level examination in Chemistry may request advanced credit in Chemistry 213. Those who have completed the Subsidiary Level examination in Chemistry may apply to the Department of Chemistry for advanced placement in Chemistry 213.

Senior Courses

Note: In all senior courses in Chemistry with a laboratory component, a charge will be levied for excessive breakage of glassware or equipment.

Chemistry 301 3 units; H(3-0)

The Chemical World
The focus is on developing a general awareness and appreciation of the chemistry all around us; where chemical principles are surveyed in a variety of current and everyday contexts.

Antirequisite(s): Not open to students in Honours, Majors or Minors in Chemistry programs, or to Environmental Science and Natural Sciences students with concentrations in Chemistry. Credit for Chemistry 301 and any of 201, 203, 209, 211 or 213 will not be allowed.

Note: Some previous exposure to chemistry, e.g. Chemistry 20, is strongly recommended. This course will not serve as a prerequisite for senior chemistry courses.

Chemistry 311 **3 units; H(3-4)**

Analytical Chemistry: Quantitative Analysis
Lectures: Principles and practice of precision measurement in chemistry; statistical treatment of data; acid-base and oxidation-reduction equilibria; complexometric analysis. Laboratory: Quantitative analysis of organic and inorganic materials.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213, and Mathematics 249 or 251 or 265 or 275 or Applied Mathematics 217.

Chemistry 315 **3 units; H(3-4)**

Analytical Chemistry: Introductory Instrumental Analysis
Lectures: Principles and practice of instrumental measurements for the quantitative determination of substances. Spectroscopic analysis. Analytical separations; liquid-liquid extraction, solid phase extraction, chromatography. Electrochemical methods: potentiometry, voltammetry, coulometry. Automated methods of analysis. Laboratory: Quantitative analysis of organic and inorganic materials using simple instrumental techniques.

Prerequisite(s): Chemistry 311.

Chemistry 321 **3 units; H(3-0)**

Environmental Chemistry
A survey course of major aspects of environmental chemistry including the natural chemical cycles in the biosphere, geosphere, hydrosphere and atmosphere and the consequences of anthropogenic disturbances to these cycles. Topics discussed will include: Aquatic Chemistry and Water Pollution; Atmospheric Chemistry and Its Alteration; Soil Chemistry and the Fate of Pollutants; Hazardous Waste; Toxicological Chemistry.

Prerequisite(s): One of Chemistry 203, 209 or 213.

Chemistry 331 **3 units; H(3-3)**

Inorganic Chemistry: Main Group Elements
Lectures: The structure of many-electron atoms; bonding, stereochemistry and symmetry in inorganic compounds; solid-state science and aspects of inorganic solution chemistry. The chemistry of the main group elements. Laboratory: Applications of chemical principles to inorganic synthetic and qualitative analytical problems.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213.

Chemistry 333 **3 units; H(3-3)**

Inorganic Chemistry: Transition Metals
Lectures: Bonding models for metals and for transition metal compounds; interpretation of redox and thermodynamic properties based on ligand field theory; co-ordination and organometallic compounds of the transition metals; metal complexes as catalysts in industry and biology. Laboratory: Synthesis, analysis, and physical investigations of transition metal compounds which illustrate their important properties.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213 and 331.

Chemistry 351 **3 units; H(3-1T-3)**

Organic Chemistry I
An introduction to Organic Chemistry from a mechanistic perspective. Structure, bonding, and function, e.g. physical properties and reactivity. Stereochemistry, kinetics and thermodynamics, spectroscopy (nuclear magnetic resonance, infrared, ultra-violet/visible, and mass spectrometric techniques). Substitution and elimination reactions of saturated functional groups - the chemistry of alkanes, alkyl halides, alcohols and their derivatives. Laboratory: Practical techniques.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213.

Antirequisite(s): Credit for Chemistry 351 and 357 will not be allowed.

Note: Students are advised to take Chemistry 351 and 353 in consecutive terms.

Chemistry 353 **3 units; H(3-1T-3)**

Organic Chemistry II
The concept and implications of aromaticity. The reactions of unsaturated functional groups via substitution, elimination and addition mechanisms: the chemistry of alkenes, alkynes, aromatics, aldehydes, ketones and carboxylic acids and their derivatives. Laboratory: Characteristic functional group reactivity, synthesis, and qualitative organic analysis.

Prerequisite(s): Chemistry 351.

Antirequisite(s): Not open to students in Chemistry programs. Credit for Chemistry 353 and either 355 or 357 will not be allowed.

Note: Students are advised to take Chemistry 351 and 353 in consecutive terms.

Chemistry 355 **3 units; H(3-1T-3)**

Organic Chemistry II (for Chemists)
Mechanisms and synthetic applications of the reactions of alkenes, alkynes, aromatics, carbonyl compounds, carboxylic acids and derivatives, and conjugated systems such as 1,3-dienes and enones. The concept of aromaticity and its effect on chemical behaviour. Laboratory: Emphasis on organic synthesis and the methods of qualitative organic analysis.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213 and 351 and admission to the Chemistry major, Applied Chemistry major or Chemical Physics major.

Antirequisite(s): Credit for Chemistry 355 and either 353 or 357 will not be allowed.

Note: Open to students in other programs by consent of the Department. Students are advised to take Chemistry 351 and 355 in consecutive terms. Honours Biochemistry majors interested in taking this course should contact the Department of Chemistry regarding permission to enrol.

Chemistry 357 **3 units; H(3-1T)**

Industrial Organic Chemistry for Engineers
The hybridization of the carbon atom and covalent bonding. Typical reactions of alkanes, alkenes, alkynes and industrial applications. Substitution; halogenation, nitration and oxidation of aromatic hydrocarbons; polymerization and industrial applications. Functional groups and their reactions; oxidation, reduction, addition and elimination reactions, industrial applications.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213, or 209.

Antirequisite(s): Credit for Chemistry 357 and any of 351, 353 or 355 will not be allowed.

Chemistry 371 **3 units; H(3-1T-3)**

Physical Chemistry: Thermodynamics Chemistry
Lectures: A study of the states of matter. The basic laws of thermodynamics and their applications. Development of the concept of chemical potential. Changes of state and phase diagrams of pure substances and mixtures. Equilibrium electrochemistry. Laboratory: Experimental measurements, interpretations, and calculations relating to the topics discussed in lectures.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213, Physics 223 or 255; Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219.

Antirequisite(s): Credit for Chemistry 371 and any of Physics 347, 349, or 447 will not be allowed.

Chemistry 373 **3 units; H(3-1T-3)**

Physical Chemistry: Quantum Chemistry
Lectures: Elementary quantum mechanical treatment of the energy levels of atoms and molecules. Atomic spectra. Symmetry elements, operations, and point groups. Laboratory: Experimental measurements, interpretations, and calculations relating to the topics discussed in lectures.

Prerequisite(s): Chemistry 201 or 211, and 203 or 213; Physics 223; Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219.

Chemistry 402 **3 units; H(0-9)**

Introduction to Research in Chemistry
A chemistry-based research project under the supervision of an academic staff member.

402.01 – Introduction to Research in Chemistry I

402.02 – Introduction to Research in Chemistry II

Prerequisite(s): Chemistry 201 or 211, and 203 or 213, and consent of the Department.

Chemistry 409 **3 units; H(3-0)**

Applied Chemistry and Chemical Pathways for Engineers
Analysis of industrial chemical processes based on reaction pathways to infer system performance including co-product formation and the role of catalysts. Examples from oil, gas, coal and petrochemical processing.

Prerequisite(s): Chemistry 209 and 357.

Chemistry 417 **3 units; H(3-0)**

Modern Chromatographic Analysis
Fundamental concepts and methods of chromatographic separation science: partition theory, sample preparation, chromatographic theory, gas and liquid chromatography, principles of detection. Emerging concepts such as micro-fluidic separation platforms, column technology and novel mobile phases.

Prerequisite(s): Chemistry 311 and 315.

Chemistry 423 **3 units; H(3-0)**

Green Chemistry: Principles and Techniques
Green Chemistry focuses on the science and techniques that chemists and chemical and process engineers use to generate less waste, and to develop products and processes that are more atom- and energy-efficient, environmentally sensitive, and cost-effective. This course will look at the principles behind green chemistry, some techniques and processes used in achieving atom- and energy-efficiency, and waste reduction.

Prerequisite(s): Chemistry 333 and one of 353 or 355; or Chemistry 357 and 409.

Chemistry 425 **3 units; H(3-0)**

Industrial Chemistry
Electrochemical processes and the applications of some of their products. Unit operations and reactor types in the chemical industry. Petroleum refining including heavy oil and bitumen. Industrial organic synthesis including monomers for subsequent polymerization. Design of specialized polymers.

Prerequisite(s): Chemistry 353 or 355.

Chemistry 453 **3 units; H(3-4)**

Advanced Organic Chemistry
Introduction to MO theory. Pericyclic reactions, the Woodward-Hoffmann rules. Photochemistry. Elucidation of reaction mechanism, reactive intermediates. Laboratory: Multi step synthesis and computer modelling of organic reactions.

Prerequisite(s): Chemistry 351 and one of Chemistry 353 or 355.

Chemistry 471 **3 units; H(3-1T-3)**

Physical Chemistry: Kinetics and Spectroscopy
Vibrational, electronic and magnetic resonance spectra. Reaction kinetics and transport properties in the gas phase and in solution. Catalysis. Laboratory: Experimental measurements, interpretations, and calculations relating to the topics discussed in lectures.

Prerequisite(s): Chemistry 371 and 373.

Chemistry 502 **6 units; F(0-9)**

Research in Chemistry
Comprehensive research project under the direction of a staff member. A research report must be presented on completion of the course, and attendance at a weekly research seminar is expected.

Prerequisite(s): Consent of the Department.

Note: It is recommended that students have completed the third year of their program in Chemistry, Applied Chemistry or Chemical Physics.

MAY BE REPEATED FOR CREDIT

Chemistry 515 **3 units; H(3-4)**

Advanced Instrumental Analysis
Lectures: Fundamental aspects of modern instrumental methods. Spectroscopic methods: UV-visible and atomic absorption spectroscopy, flame and plasma emission methods. Chromatographic methods; liquid and gas chromatography. Mass spectrometry. Laboratory: Analysis of inorganic and organic samples using spectroscopic, electrochemical, and chromatographic instrumental methods.

Prerequisite(s): Chemistry 311 and 315.

Chemistry 521 **3 units; H(3-0)**

Introduction to Atmospheric Chemistry
An introduction to tropospheric and stratospheric chemistry. The detailed chemistry of the stratosphere and troposphere; gas-phase chemical kinetics; photochemistry and atmospheric radiation; aerosols; anthropogenic pollution and air quality; climate forcing; introduction to modelling and atmospheric transport.

Prerequisite(s): Chemistry 315 and 373.

Note: Chemistry 471 is recommended as a prerequisite.

Chemistry 531 **3 units; H(3-1T)**

Advanced Inorganic Chemistry I
Co-ordination and organometallic chemistry of the transition elements, incorporating the lanthanoids and actinoids. Fundamental and applied aspects, including characterization techniques, reaction mechanisms, catalysis and bioinorganic chemistry.

Prerequisite(s): Chemistry 331, 333 and one of 353 or 355.

Chemistry 533 **3 units; H(3-1T)**

Advanced Inorganic Chemistry II
Chemistry of the s- and p-block elements. Interpretation of nuclear magnetic resonance, electron paramagnetic resonance, vibrational and mass spectra. Fundamental concepts and industrial uses of inorganic heterocycles and polymers, electron-deficient and organometallic compounds. Solid-state chemistry.

Prerequisite(s): Chemistry 331, 333 and one of 353 or 355.

Chemistry 535 **3 units; H(1-8)**

Advanced Inorganic Laboratory
Advanced laboratory techniques for the synthesis and characterization of main group compounds, organometallics and solid-state materials using modern spectroscopic and structural methods. Includes a short project.

Prerequisite(s): Chemistry 331, 333 and 453 and admission to the Chemistry major, Applied Chemistry major or Chemical Physics major.

Note: Open to students in other programs by consent of the Department.

Chemistry 541 (Biochemistry 541) **3 units; H(3-0)**

Biochemical Toxicology
An interdisciplinary course focused on the diverse biomolecular mechanisms by which organic (e.g. PCB's) and inorganic pollutants (e.g. Cd, Hg, As) adversely affect cell function examined at multiple levels of organization, from molecules to whole organisms. Topics include how natural toxins exert toxicity, how toxins/light generate free radicals within cells, how the speciation of metals in the environment affects their bioavailability/toxicity, and the toxicity mechanisms that lead to homeostatic dysfunction.

Prerequisite(s): Any two of Biology 231, 233, 241 or 243; Biochemistry 341 or 393; Chemistry 311, 321 and 351.

Antirequisite(s): Credit for Chemistry 541 and either Chemistry 641 or Biochemistry 541 will not be allowed.

Chemistry 551 **3 units; H(3-1T)**

Organic Synthesis
Concepts and strategies of synthesizing molecules with emphasis on carbon-carbon bond-forming reactions, protecting groups, chemo-, regio- and stereoselectivity.

Prerequisite(s): Chemistry 453.

Chemistry 553 **3 units; H(3-1T)**

Bio-organic Chemistry
Organic chemistry applied to the understanding of biomolecules: selected topics from carbohydrate, peptide/protein, lipid and nucleoside chemistry, enzyme inhibition and drug design.

Prerequisite(s): Chemistry 453.

Chemistry 555 **3 units; H(1-8)**

Advanced Organic Laboratory
Advanced laboratory techniques: methods of purification and identification of products, purification of reagents, experimental design, working with air/moisture sensitive reagents. Includes a short research project.

Prerequisite(s): Chemistry 453 and admission to the Chemistry major, Applied Chemistry major or Chemical Physics major.

Note: Open to students in other programs by consent of the Department.

Chemistry 559 **3 units; H(3-1T)**

Organic Spectroscopy
The instrumentation, theory and practical aspects of spectroscopy (e.g. UV/vis, MS, IR, 1H and 13C NMR including 2D-techniques). The emphasis will be on the application for structural elucidation through a problem solving approach.

Prerequisite(s): Chemistry 351 and one of 353 or 355.

Chemistry 571 **3 units; H(3-0)**

Physical Chemistry of Interfaces
The chemical and electrical nature, as well as basic thermodynamics, of interfaces. Surface films and aqueous interfaces, including micelles and bilayers. Interfaces involving solids such as metals and semiconductors. Absorption phenomena and surface catalysis. Survey of experimental approaches for interfacial studies.

Prerequisite(s): Chemistry 371 and 373.

Chemistry 573 **3 units; H(3-0)**

Nature of the Condensed Phase in Chemistry
Theoretical models of liquids and solids. Dielectric continuum, polarizabilities and magnetism. Ionic crystal, insulators, conductors, semiconductors and super conductors. Some aspects of scattering techniques for structure determination.

Prerequisite(s): Chemistry 371 and 373.

Chemistry 575 **3 units; H(3-1T-3)**

Advanced Electronic Structure Theory
A discussion of the theories of modern electronic structure illustrated by applications to molecular structure and bonding, electronic spectroscopy, as well as chemical reactivity and dynamics.

Prerequisite(s): Chemistry 371 and 373.

Chemistry 579 **3 units; H(3-0)**

Surface and Colloid Chemistry for Engineers
Introduces the fundamental and applied aspects of interfacial phenomena including capillarity, surface and interfacial tension, films, wetting and contact angles, adsorption, micellization, solubilization and emulsification. Examples drawn from colloids, foams, aerosols and macromolecules.

Prerequisite(s): Chemistry 209, 357 and Chemical Engineering 427.

Chemistry 599 **3 units; H(3-0)**

Selected Topics in Chemistry
Selected topics are offered based on the interests of Chemistry faculty and students.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Advanced graduate level courses are listed below. Courses in certain areas are grouped under "Selected Topics" titles. The content and offering of these are decided annually by the Department to meet the requirements of graduate students in the program. A student may receive credit for several courses in a given selected topics area. Details of offerings and course outlines may be obtained from the Department on request.

Unless stated otherwise the prerequisite for entry to all courses at the 600 level and above is "consent of the Department." Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Chemistry 601 **3 units; H(2S-0)**

Research Seminar
Reports on studies of the literature or of current research. Required of all graduate students in Chemistry.

NOT INCLUDED IN GPA

Chemistry 603 **3 units; H(2S-0)**

Research Seminar
Continuation of Chemistry 601.

NOT INCLUDED IN GPA

Chemistry 613 **3 units; H(3-0)**

Electrochemical Fundamentals and Methodologies
Origin, significance, and thermodynamics of interfacial potential differences; structure of the double layer; basic principles of electron transfer at interfaces, Butler-Volmer equation; mass transport control of electro-chemical reactions; controlled potential methods as applied to electrode surface reactions and homogeneous reactions coupled to electron-transfer processes.

Chemistry 615 **3 units; H(3-0)**

Analytical Separations
Theory and practice of resolving mixtures into separate components for analysis. Basic theory; liquid-liquid extraction; high performance liquid chromatography; gas-liquid, open bed, ion exchange and exclusion chromatography; electrophoresis.

Chemistry 617 **3 units; H(3-0)**

Advanced Analytical Chemistry
Consideration of principles and equilibria pertaining to aqueous and nonaqueous neutralization, redox, complexation, precipitation and potentiometric methods employed in analyses. Statistical considerations of analytical data and analysis.

Chemistry 619 **3 units; H(3-0)**

Selected Topics in Analytical Chemistry
Topics of current interest such as: properties of synthetic polymer membranes, advanced instrumental methods, developments in chemical sensors, speciation studies, environmental analytical chemistry.

MAY BE REPEATED FOR CREDIT

Chemistry 621 **3 units; H(3-0)**

Organometallic Chemistry
A detailed discussion of structure, bonding and preparative methods in organometallic chemistry including the industrial and synthetic applications of organometallic compounds.

Chemistry 623 **3 units; H(3-0)**

Chemistry of the Main Group Elements
The chemistry of electron-deficient, electron-precise, and electron-rich rings, inorganic polymers, and organometallic compounds of the main group elements; applications of spectroscopic techniques; industrial uses. Seminars on recent research developments.

Chemistry 627 **3 units; H(3-0)**

Theoretical Inorganic Chemistry
Aspects of theoretical inorganic and organometallic chemistry including: quantitative and qualitative molecular orbital theory; the bonding and structure of molecules, clusters, and extended arrays; the fragments of organometallic species; orbital correlation diagrams in inorganic reactions; spectroscopic methods and their interpretation.

Chemistry 629 **3 units; H(3-0)**

Selected Topics in Inorganic Chemistry
Courses are offered to cover topics of current interest, such as bioinorganic chemistry, inorganic solution phenomena, and the inorganic chemistry of the solid state.

MAY BE REPEATED FOR CREDIT

Chemistry 641 **3 units; H(3-0)**

Biochemical Toxicology
An interdisciplinary course focused on the diverse biomolecular mechanisms by which organic (e.g. PCB's) and inorganic pollutants (e.g. Cd, Hg, As) adversely affect cell function examined at multiple levels of organization, from molecules to whole organisms. Topics include how natural toxins exert toxicity, how toxins/light generate free radicals within cells, how the speciation of metals in the environment affects their bioavailability/toxicity, and the toxicity mechanisms that lead to homeostatic dysfunction.

Antirequisite(s): Credit for Chemistry 641 and either Chemistry 541 or Biochemistry 541 will not be allowed.

Chemistry 651 **3 units; H(3-0)**

Advanced Organic Stereochemistry
Stereochemical principles in organic chemistry, including: geometry, bonding, symmetry, molecular isomerism, conformational analysis, asymmetric and stereocontrolled reactions.

Chemistry 653 **3 units; H(3-0)**

Advanced Organic Spectroscopy
Advanced spectroscopic techniques for the determination of complex organic structures. Emphasis will be on NMR methods, practical aspects of acquiring spectra, advanced interpretation and reporting spectral data.

Chemistry 655 **3 units; H(3-0)**

Advanced Organic Synthesis
A review of modern synthetic reactions and methods in the field of organic chemistry with emphasis on the recent literature.

Chemistry 657 **3 units; H(3-0)**

Theoretical Organic Chemistry
Theoretical principles of organic chemistry including stereochemistry, molecular orbital calculations, pericyclic processes (Woodward-Hoffmann rules), and PMO theory.

Chemistry 659 **3 units; H(3-0)**

Selected Topics in Organic Chemistry
Courses are offered in major branches of organic chemistry, including: carbohydrate chemistry, steroids and terpenoids, semiochemistry, heterocyclic chemistry, biosynthesis of secondary metabolites, as well as other topics of current interest.

MAY BE REPEATED FOR CREDIT

Chemistry 669 **3 units; H(3-0)**

Selected Topics in Applied Chemistry
Courses are offered in such topics as electrochemistry, industrial catalysis, chemistry of energy sources, colloid and surface chemistry and polymer chemistry.

MAY BE REPEATED FOR CREDIT

Chemistry 681 **3 units; H(3-0)**

Crystallography
A general introduction to X-ray analysis of single crystals. Topics include: Geometry of the crystalline state; diffraction of X-rays; Fourier synthesis; methods of structure solution; accuracy and precision of derived parameters.

Chemistry 689 **3 units; H(3-0)**

Selected Topics in Physical Chemistry
Courses are offered in such topics as dielectric properties, kinetics, molecular vibrations, fluorescence spectroscopy, X-ray diffraction.

MAY BE REPEATED FOR CREDIT

Chemistry 701 **3 units; H**

Independent Study
Independent study not directly related to the student's thesis project normally under the direction of any chemistry faculty member. A course information sheet must be provided and a student report must be submitted on completion of the course.

Note: Multiple 701 courses can be offered in any one term, however individual students may take only one 701 course for credit in program.

Chinese CHIN

Instruction offered by the Department of Linguistics, Languages, and Culture in the Faculty of Arts. Students are encouraged to consult the Department website (llc.ucalgary.ca/) for more details on course descriptions and titles of decimalized courses.

Note: Chinese 317, 355 and 357 are given in English and no knowledge of Chinese is required.

All students wishing to take Chinese language courses for the first time must consult the Department to be placed in an appropriate course. Native speakers are not eligible to take language courses, but are eligible to take Chinese literature, linguistics and culture courses such as 317, 353, 355, 357, 431, 461 and 561.

Junior Courses

Chinese 205 **3 units; H(4-1)**

Beginners' Chinese I
Basic concepts of the Chinese National Language. Reading and writing of characters, essentials of grammar, basic vocabulary, and oral drills on normal speech patterns.

Prerequisite(s): Consent of the Department.

Note: Not open to students with credit in Chinese 20, 25, 30 or 35. Students wishing to take Chinese language courses for the first time must consult the Department to be placed in an appropriate course.

Chinese 207 **3 units; H(4-1)**

Beginners' Chinese II
Continuation of Chinese 205.

Prerequisite(s): Chinese 205.

Note: Not open to students with credit in Chinese 30 or 35.

Chinese 229 **3 units; H(2-2)**

Intensive Beginners' Chinese
Intensive development of conversational skills and the pronunciation of the Chinese National Language. Enhanced training in vocabulary acquisition, grammar and writing. For students with a background in a Chinese dialect.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Chinese 229 and either 205 or 207 will not be allowed.

Chinese 279 **3 units; H(1-2)**

Reading and Writing Chinese
Introduction to the Chinese language for students who have a background in Mandarin and other

Chinese dialects, but limited reading and writing ability. Students will learn to read and write characters, and acquire the essentials of basic vocabulary and grammar.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Chinese 279 and either 205 or 207 will not be allowed.

Senior Courses

Chinese 301 **3 units; H(3-1)**

Continuing Chinese I
Further acquisition of Chinese characters, and the development of conversational skills through reading and discussion of selected Chinese texts. Structural analysis of normal speech patterns. Preparation of written assignments. A continuation of Chinese 207.

Prerequisite(s): Chinese 207.

Antirequisite(s): Credit for Chinese 229 and 301 will not be allowed.

Chinese 303 **3 units; H(3-1)**

Continuing Chinese II
Continuation of Chinese 301.

Prerequisite(s): Chinese 301.

Antirequisite(s): Credit for Chinese 303 and 229 will not be allowed.

Chinese 309 **3 units; H(3-2)**

Chinese Culture in an Immersion Setting
An introduction to contemporary Chinese culture and functional Chinese language. This course is given during Spring/Summer Intersession in the People's Republic of China.

Prerequisite(s): Consent of the Department.

Chinese 311 **3 units; H(3-1)**

Chinese Language in an Immersion Setting I
A course in Chinese stressing the oral skills in an immersion environment. This course is given during Spring/Summer Intersession in the People's Republic of China.

Prerequisite(s): Consent of the Department.

Corequisite(s): Chinese 309.

Chinese 313 **3 units; H(3-1)**

Chinese Language in an Immersion Setting II
A continuation of Chinese 311. This course is given during Spring/Summer Intersession in the People's Republic of China.

Prerequisite(s): Chinese 311.

Chinese 317 **3 units; H(3-0)**

Topics in Chinese Civilization
Distinctive features of Chinese civilization within the Asian context.

317.01. The Human-Animal Connection

317.02. Words, Hanzi, and Things

317.03. Iconic China

Note: Taught in English. This course may be repeated for credit where the course content is different, as indicated by a different decimal number for the course. May be repeated for a maximum credit of 6 units (1.0 full-course equivalent).

Chinese 331 **3 units; H(3-0)**

Intermediate Chinese I
An intermediate course giving equal emphasis to receptive and productive language skills.

Prerequisite(s): Chinese 303.

Antirequisite(s): Credit for Chinese 331 and 229 will not be allowed.

Chinese 333 **3 units; H(3-0)**

Intermediate Chinese II
A continuation of Chinese 331.

Prerequisite(s): Chinese 331.

Antirequisite(s): Credit for Chinese 333 and 229 will not be allowed.

Chinese 341 **3 units; H(3-0)**

Introduction to Chinese Literature
Introduction to Chinese literature through the reading and discussion of selected literary works.

Prerequisite(s): Chinese 303.

Chinese 353 **3 units; H(3-0)**

Introduction to Chinese Language and Linguistics
An overview of Chinese linguistics. Provides an introduction to linguistic concepts and topics to enhance understanding of the structure of the Chinese language.

Prerequisite(s): Chinese 207.

Note: Taught in English.

Chinese 355 **3 units; H(3-0)**

Chinese Literature in Translation
Introduces the literary tradition of China by means of reading the English translations of representative works. Examines the historical and cultural background, as well as literary forms and aesthetics.

Note: Taught in English.

MAY BE REPEATED FOR CREDIT

Chinese 357 **3 units; H(3-3)**

Topics in Chinese Film
Chinese film from the perspectives of film theory and political and cultural history. The course may concentrate on a specific director, a period, or a genre in Chinese film.

357.01. The New Waves

357.02. The Fifth Generation

357.03. Focus on a Filmmaker

357.04. Focus on a Genre

Note: Taught in English. This course may be repeated for credit where the course content is different, as indicated by a different decimal number for the course. May be repeated for a maximum credit of 6 units (1.0 full-course equivalent).

Chinese 401 **3 units; H(3-0)**

Advanced Chinese Conversation
Development of Chinese oral communication skills through contemporary film, television programs and/or other audio materials with textbooks.

Prerequisite(s): Chinese 333.

Antirequisite(s): Credit for Chinese 401 and either 421 or 431 will not be allowed.

Chinese 403 **3 units; H(3-0)**

Advanced Readings and Writing in Modern Chinese
Development of Chinese reading and writing skills through newspapers, magazines, social commentary and/or literary works.

Prerequisite(s): Chinese 333.

Antirequisite(s): Credit for Chinese 403 and either 421 or 431 will not be allowed.

Chinese 431 **3 units; H(3-0)**

Selected Topics in Chinese Literature
Topics studied are listed in the Schedule of Classes.

Prerequisite(s): Chinese 403 or 421.

MAY BE REPEATED FOR CREDIT

Chinese 461 (Japanese 461) **3 units; H(3-0)**

Japanese-Chinese Cultural Relations
Discussion of cultural relations and influences between Japan and China. Topics may include cultural identities and cross-influences, literary and artistic traditions, writing systems.

Prerequisite(s): Chinese 303 or higher (excluding Chinese 317 and Chinese 355).

Note: Knowledge of Japanese would be beneficial.

Chinese 561 **3 units; H(3S-0)**

Research Seminar
Engages senior students as members of a collaborative research team. Independent research, discussion, group presentations.

Prerequisite(s): One of Chinese 403, 421 or 431.

MAY BE REPEATED FOR CREDIT

Civil Engineering ENCI

Instruction offered by members of the Department of Civil Engineering in the Schulich School of Engineering.

Senior Courses

Civil Engineering 337 **3 units; H(2-3)**

Tools for Civil Engineering Design
A course utilizing computer tools to solve practical Civil Engineering problems. The course concentrates upon the use of spreadsheets, but also involves interaction with databases, computer graphics and computer programming for analysis, design and reporting. Problems will normally be derived from several core Civil Engineering subdisciplines.

Prerequisite(s): Engineering 233.

Civil Engineering 402 **3 units; H(3-2)**

Hydraulics
Quantitative and qualitative investigation of pipe flow and free-surface fluid flow. Application of fundamental laws of mechanics to fluid flow, including conservation of mass, momentum, and energy. Use of theoretical and numerical analysis methods. Review of basic concepts of fluid motion; pressurized pipe network flow; open channel flow; uniform and non-uniform flow

Prerequisite(s): Mechanical Engineering 341.

Civil Engineering 413 **3 units; H(3-5/2)**

Introduction to Civil Engineering Materials
Engineering properties, materials science and applications of the Civil Engineering materials: strength, elasticity, fatigue, creep, shrinkage, dura-

bility, thermal deformation; introduction to fracture mechanics; Microstructure and fundamental principles underlying performance; mass transport processes, corrosion and phase transformations causing deterioration. Practical examples from difference materials sectors: steel, aggregates, cement, Portland cement concrete, masonry, asphalt concrete, natural and synthetic polymers.

Prerequisite(s): Engineering 201.

Civil Engineering 423 3 units; H(3-1T-2)

Geotechnical Engineering I

Identification and classification of soils; soil compaction; seepage; effective stress concept; stresses in a soil mass; settlement; one dimensional consolidation; shear stress and strength; introduction to slope stability; selected laboratory and design exercises with computer applications.

Prerequisite(s): Geology 471.

Civil Engineering 451 3 units; H(3-2T-1/2)

Structural Engineering I

Review of analysis of statically determinate structures. Indeterminate structures, analysis of continuous beams using the three-moment equation. Structural building materials. Principles of structural analysis and design process. Loads on structures. Structural systems. Idealized models. Load paths for gravity lateral loads. Structural safety. Philosophy of limit states design. Design principles for main structural members in steel, plain and reinforced concrete/masonry, and timber.

Prerequisite(s): Civil Engineering 461.

Civil Engineering 461 3 units; H(3-1.5T)

Mechanics of Solids and Structures

Analysis of statically determinate structures: reactions, member forces in trusses, bending moment, shearing force and axial force diagrams for frames; Introduction to indeterminate structures; Effects of moving loads, influence lines, Muller-Breslau principle; Determination of displacements using moment area theorems, energy theorems and virtual work; Maxwell's theorem; Normal stresses in non-symmetric sections; principal axes, shear centre; plastic torsion of circular shafts, torsion of non-circular sections; Principal stresses, failure theories; Elastic buckling of columns.

Prerequisite(s): Engineering 317.

Civil Engineering 471 3 units; H(3-2)

Project Management I

Introduces techniques that provide rational solutions to a range of project management decisions encountered in engineering projects. Students are expected to gain a detailed understanding of some; of the techniques, tools and processes available and their application in planning and managing engineering and construction projects; The course covers project management fundamentals including project planning and scheduling techniques, cash flow forecasting, performance evaluations and decision analysis; Introduction to operations research.

Civil Engineering 473 3 units; H(3-2)

Transportation Engineering I

Systems approach in transportation engineering and planning; Goals and objectives of urban and regional transportation planning; Introduction to transportation modes; Transportation demand models; Highway Alignment; Fundamentals of traffic flow; Highway capacity and level of service; Roadway intersection design and operation; Urban transportation technologies; Environmental and energy impacts of transportation.

Prerequisite(s): Civil Engineering 471 and Engineering 319 or consent of the instructor.

Civil Engineering 481 3 units; H(3-2)

Environmental Engineering

Analyze and develop civil engineering solutions, at a conceptual level, to human health and environmental problems associated with human activities, fundamental aspects of air, water and land pollution, water quality assessment and control, environmental aspects of non-renewable energy development, introduction to sustainability concepts in construction and transportation, solid waste management technologies, introduction to land pollution prevention and control.

Prerequisite(s): Chemistry 209 and Mechanical Engineering 341.

Civil Engineering 502 3 units; H(3-1)

Civil Engineering Aspects of Sustainable Communities

Definition of sustainability; global urbanization; emissions from transportation systems; economics of urban development from a civil infrastructure point of view, water/wastewater, land use/transportation; public transportation; travel demand management for sustainability; construction industry - energy use and emissions.

Prerequisite(s): Civil Engineering 473 and 481.

Civil Engineering 504 3 units; H(3-1)

Uncertainty Concepts in Civil Engineering

Fundamentals of uncertainty, risk, reliability and decision making in Civil Engineering applications. Probability as a measure of uncertainty based on frequency data, least presumptive methods and use of odds; Bayes' Theorem; known probability distributions and how they apply to civil engineering problems. Advanced topics including applications of extreme value distributions, joint probability distributions and stochastic optimization. Risk as a function of both probability and disutility. Risk analysis through Bayesian Decision Theory.

Prerequisite(s): Civil Engineering 471 and Engineering 319.

Civil Engineering 508 3 units; H(3-1)

Environmental Aspects of Energy

Environmental assessment and management in the energy sector. Ecological footprint introduction. Site investigation, field techniques and program implementation, remedial planning and design, cost and time analysis, physical, chemical and biological remediation techniques, biomass and waste to energy, energy use and emissions in transportation systems, energy efficiencies and emissions in building construction, assess problems with energy use from an environmental setting, develop and apply engineered solutions, ecological and environmental footprints of energy industries.

Prerequisite(s): Civil Engineering 481.

Civil Engineering 513 3 units; H(3-2T)

Structural Concrete Materials and Design

Practical examination of concrete mix design (Portland cement), processes and systems to improve performance and sustainability of Civil Engineering structures. Flexural design in reinforced concrete. Design of continuous beams and one-way slabs using moment coefficients. Shear design. Bond and development. Serviceability. Two-way slab systems: direct design method, punching shear. Columns. Design principles for concrete members reinforced with Fiber-Reinforced Polymers. Use of computer software for analysis and design of simple concrete structures.

Prerequisite(s): Civil Engineering 413 and 451.

Civil Engineering 523 3 units; H(3-1T-2/2)

Geotechnical Engineering II

Sub-surface investigations; soil shear strength, critical states and laboratory tests; shallow and deep foundations in sands and clays; bearing capacity and settlement of structures; lateral earth pressures and retaining structures; seepage analysis; slope stability analysis, selected laboratory design exercises, solution to slope stability and other problems using computer programs.

Prerequisite(s): Civil Engineering 423.

Civil Engineering 551 3 units; H(3-2T)

Structural Engineering II

Review of analysis of statically determinate structures. Static and kinematic indeterminacy. Principle of superposition. The force/flexibility and displacement/stiffness methods for the analysis of statically indeterminate structures. Calculation of displacements. Inelastic buckling of columns. Use of computers for the analysis of plane frames and grids. Plastic analysis of continuous beams, frames and plates. Yield line theory.

Prerequisite(s): Civil Engineering 451.

Civil Engineering 557 3 units; H(3-2T)

Structural Steel Design

Principles of limit states design of steel structures. Floor systems, resistance to horizontal forces. Properties of steel. Tension members. Eccentrically-loaded bolted and welded connections; connection details. Axially-loaded compression members. Laterally unsupported beams. Members subjected to bending and axial forces; beam-column effect. Composite beams. Plate girders. Design of a simple steel structure and use of available computer software to assist in analysis and design of steel structures.

Prerequisite(s): Civil Engineering 451 and 551.

Civil Engineering 565 3 units; H(3-1)

Project Management II

Introduces fundamentals of engineering and construction management techniques, tools and processes. The course covers understanding of design and contract documents, estimating and cost control; project organizations, design of temporary facilities including formwork and safety related matters, construction processes, dispute resolution, social, economic and environmental impacts, regulatory requirements, project completion and commissioning.

Prerequisite(s): Civil Engineering 471.

Civil Engineering 570 6 units; F(0-4)

Group Design Project

Team design project applying engineering and project management principles to civil engineering design problems; Consideration of technical, resource allocation and business aspects of project; Development of project scope, design, specifications, scheduling and documentation; Elements of practical team management and leadership; Specific guidance provided by academic and industry advisors.

Prerequisite(s): Civil Engineering 402, 413, 423, 451, 461, 471, 473, and 481.

Note: Departmental consent will only be granted in exceptional cases if students are missing no more than one of the courses listed above. Concurrent enrolment in Civil Engineering 570 and one or more of Internship 513.01, 513.02, 513.03, and 513.04 will not be allowed.

Civil Engineering 571 **3 units; H(3-1)**

Introduction to Road Safety
Theory and evidence in accident analysis and prevention. Topics include Haddon's matrix, crash data analysis, traffic enforcement, road safety advertising, fleet safety, road safety audits, vehicle safety and program evaluation.

Prerequisite(s): Civil Engineering 473 and Engineering 319.

Civil Engineering 575 **3 units; H(3-1)**

Transportation Engineering II
An introduction to the fundamentals of how various transportation systems are designed and operated. Topics to be covered include: public transit design and operation, highway engineering and design, airport design, traffic system design and operations, before and after studies and Intelligent Transportation Systems.

Prerequisite(s): Civil Engineering 471, 473 and Engineering 319.

Civil Engineering 581 **3 units; H(3-1)**

Environmental Engineering II
Water and wastewater quantities and quality, water distribution and wastewater collection systems, hydraulic considerations, design of sanitary sewers, storm drainage systems, physical, chemical, and biological processes for water and wastewater treatment; aeration, coagulation, flocculation, sedimentation, single and multi-media filtration, disinfection, activated sludge system and trickling filter, adsorption, reverse osmosis, membrane filtration, advanced oxidation, sludge processing and disposal, industrial water and wastewater treatment, water conservation, reuse and recycling.

Prerequisite(s): Civil Engineering 481 and Mechanical Engineering 341.

Civil Engineering 595 **3 units; H(3-1)**

Special Topics
Current topics in Civil Engineering.

Prerequisite(s): Consent of the Department Head.

MAY BE REPEATED FOR CREDIT

Civil Engineering 597 **3 units; H(0-5)**

Civil Engineering Project I
Individual work on an assigned Civil Engineering topic under the supervision of a faculty member. The project will normally involve a literature review, theoretical and laboratory or field work. Submission of a mid-term progress report defended orally and a final report.

Note: Open to students who have completed the third year Civil Engineering program with a GPA of 3.00 or better and/or Department Heads approval.

Graduate Courses

Registration in all courses requires the approval of the Department of Civil Engineering. For a more complete listing of Environmental Engineering graduate courses look under Environmental Engineering.

Civil Engineering 611 **3 units; H(3-1)**

Bituminous Materials
Origin of bituminous materials. Production, composition, and internal structure. Natural and petroleum-refined bituminous materials. Characteristics of bituminous materials and their measurement. Basic material and rheological tests. Application of bituminous materials in asphalt paving technologies. Hot mixes and asphalt emulsions. Paving mix design, properties and testing. Main failure modes of asphalt pavements. Industrial asphalts. Environmental impacts of asphalt technologies.

Civil Engineering 615 **3 units; H(3-0)**

Rheology of Engineering Materials
Elements of tensor calculus. Constitutive equations. Linear and non-linear viscoelasticity. Dielectric properties of materials. Rheometry. Temperature and molecular mass dependencies of material functions. Relations between material functions. Microstructure and rheology of materials.

Civil Engineering 617 **3 units; H(3-0)**

Fracture of Civil Engineering Materials
Cohesive strength; plasticity. Fracture mechanics in relation to structural steel, stress intensity, fracture toughness, energy release rate, LEFM, COD, J-Integral, R-Curve, fatigue. Compressive fracture of concrete, masonry and rocks; cracking patterns, fracture theories, damage models, test methods and effects.

Civil Engineering 619 **3 units; H(3-0)**

Special Problems
Designed to provide graduate students, especially at the PhD level, with the opportunity of pursuing advanced studies in particular areas under the direction of a faculty member. Students would be required to consider problems of an advanced nature.

MAY BE REPEATED FOR CREDIT

Civil Engineering 621 **3 units; H(3-0)**

Computer Analysis of Structures
Review of the displacement method of structural analysis, energy theorems, and transformation of force and displacement matrices. Computer analysis of framed structures: banded stiffness matrices, assemblage of stiffness matrices, displacement and support conditions and calculation of reactions, solution of banded equations. Structural symmetry, anti-symmetry and cyclic symmetry. Analysis of large structures by substructuring. Analysis of shear wall structures. Introduction to the finite element method: displacement functions, stiffness matrix formulation, consistent load vectors, isoparametric elements. Non-linear analysis: effect of axial forces combined with large displacements, geometric stiffness matrix, Newton-Raphson techniques, examples of geometric non-linearity, non-linear buckling, cable networks including membrane elements, analysis of structures made of non-linear materials. Structuring and composition of available structural analysis computer programs, and their applications.

Civil Engineering 623 **3 units; H(3-0)**

Behaviour and Design of Reinforced Concrete Members
Behaviour and strength of reinforced concrete members; materials; safety; design of members subjected to flexure, compression, compression and flexure including biaxial bending, shear, torsion; bond and anchorage; slender columns; deep beams; serviceability; rotation capacity; relation between results of research and current design codes.

Civil Engineering 627 **3 units; H(3-0)**

Serviceability of Concrete Structures: Advanced Topics
Material properties affecting serviceability: creep and shrinkage of concrete and relaxation of prestressed steel. Displacement method of analysis of strains and stresses due to temperature, creep and shrinkage; composite sections; cracked sections. Time-dependent internal forces; effects of loading, prestressing and construction in stages. Displacements of cracked members; crack spacing; stabilized cracks; force-induced and displacement-induced cracking. Deflections of beams, frames, slabs and floor systems. Non-linear effects of cracking on internal forces. Effects of temperature. Fatigue of cracked prestressed members. Corrosion; effects of cracking. Serviceability considerations of miscellaneous structures, e.g., bridges, water-retaining structures and pavements.

Civil Engineering 629 **3 units; H(3-0)**

Computational Modelling of Concrete Structures
Discussion of linear finite element analysis; non-linear analysis and iterative techniques; constitutive relations and failure theories; modelling of reinforcement and prestressing; cracking models and post-cracking behaviour; tension stiffening and strain softening; models for shear transfer; time-dependent effects of creep, shrinkage and temperature; behaviour under cyclic loading and dynamic effects; numerical examples and computer applications on analysis of beams, frames, slabs, shear panels and walls, thin shells, axisymmetric solids and three dimensional structures.

Civil Engineering 633 **3 units; H(3-0)**

Fibre Reinforced Polymers for Construction and Repair of Structures
Properties and behaviour of various types of Fibre-Reinforced Polymers (FRP) materials. Limit States Design, procedures and design philosophy of structures reinforced or strengthened with FRP. Flexural and shear design. FRP systems for flexural and shear strengthening of structures. Axial strengthening of columns. Concrete prestressed with FRP. Durability and fire resistance, blast mitigation and repair using FRP. Case studies and field applications.

Civil Engineering 635 **3 units; H(3-0)**

Behaviour and Design of Prestressed Concrete Bridges and Other Structures
Forces due to prestressing in statically indeterminate structures such as continuous beams, frames, slabs, using load balancing method, force method and prestressing influence coefficients. Limit analysis of continuous prestressed concrete structures. Design of prestressed flat slabs. Initial and time-dependent deflections. Effect of creep and shrinkage in statically indeterminate structures; effect of differential settlement; creep behaviour of structures made continuous by cast-in situ concrete. Discussion of various types of prestressed concrete bridges; selection of cross-section, pier arrangement, abutments, approach slab, bearings. Loads. Design of skew and curved bridges. Cable layout in skew and curved bridges. Methods of bridge construction. Aesthetic considerations in bridge design.

Civil Engineering 637 **3 units; H(3-0)**

Behaviour and Design of Prestressed Concrete Members
Flexural analysis and design of prestressed and partially prestressed concrete members based on stresses, deflections and strength. Design of members subjected to shear, torsion, compression or tension. Fire resistance. Composite members. Bond and anchorage zones. Prestressing losses and time-dependent deformations. Discussion of current design standards.

Civil Engineering 639 **3 units; H(3-0)**

Structural Dynamics
Numerical analysis of simple systems; rigorous analysis of one-degree systems; lumped mass multi-degree systems and structures with distributed mass and load; approximate analysis and design methods; earthquakes, blast-resistant design, beams subjected to moving loads; calculation of results by analog and digital computer.

Civil Engineering 641 **3 units; H(3-0)**

Seismic Analysis and Design
Introduction to seismology, ground movements, typical accelograms. Response spectra for linear and non-linear responses, role of damping and inelastic behaviour. Equivalent lateral load for design, code requirements. Structural design concepts to mitigate seismic effects. Design of steel structures for earthquake motions. Design of concrete frames and walls for earthquake motions.

Prerequisite(s): Civil Engineering 639.

Civil Engineering 643 **3 units; H(3-0)**

Structural Masonry Design
Component materials and their properties, masonry properties, quality control, plain and reinforced masonry, beams, walls, slender walls, columns, load-moment interaction curves, concentrated load bearing, shear load distribution, shear walls, code provisions, building envelope, detailing, differential movement, geometric walls, prestressed masonry, arches.

Antirequisite(s): Credit for Civil Engineering 643 and either 553 or 595.05 will not be allowed.

Civil Engineering 645 **3 units; H(3-0)**

Risk Analysis
The objective of this course in engineering risk analysis and risk assessment is to familiarize students with the principles and techniques of quantitative risk analysis. Key focus points are the treatment of uncertainties, the attitude of conservatism, risk perception, the careful use of quantitative risk measures, and a discussion of the dangers tasks facing risk-based decision makers. Includes: Hazards, risk, risk analysis, risk assessment; risk measures; probability, uncertainty modelling, stochastic variables; using and misusing data, reliability, tails; risk assessment frameworks, models in health and environmental risk analysis, models in engineering risk analysis; risk perception, risk comparison; and practical case studies.

Civil Engineering 647 **3 units; H(3-0)**

Structural Reliability Techniques
The concepts of risk and reliability, uncertainties, and engineering decision making. Focuses on both aspects of uncertain systems, mainly structures, but also soils and environments, namely analysis and design. Techniques for structural reliability-based design and optimization are discussed and supplemented by practical applications.

Civil Engineering 653 **3 units; H(3-0)**

Theory and Applications of the Finite Element Method
Conceptual framework of the finite element method with emphasis on applications to structural analysis: shape functions, continuity at nodes, numerical integration, matrix assembly. Scope of the method, use of basic equations of elasticity, displacement (stiffness) method of analysis. Sources of error and poor performance; mesh sensitivity; element types, their selection and behaviour. Applications in structural analysis, heat conduction and other non-structural problems; use of available finite element programs.

Civil Engineering 655 **3 units; H(3-0)**

Numerical Methods for Modelling Geomaterials
Methods of theoretical analysis for solving partial differential equations associated with Geotechnical and Structural Engineering. Variational Principles, Principle of Virtual Work and Galerkin Method. Theory of finite element and focus on its computer implementation for analysis of engineering problems. Typical applications include two- and three-dimensional stress analysis, seepage flow, and coupled fluid flow-solid deformation problems. Advanced topics: numerical strategies for solving material and geometric non-linearities (plasticity and large deformations), poro-elasticity and plasticity, strain localization, and presentation of other numerical techniques such as finite difference, boundary element, discrete element methods.

Civil Engineering 657 **3 units; H(3-0)**

Airport Planning and Engineering
Planning of airport systems; planning and design of the airfield; airside capacity and delay; air traffic control; planning and design of the passenger terminal; analysis of airport operations.

Civil Engineering 659 **3 units; H(3-0)**

Sustainable Infrastructure
Sustainability and durability issues of structural materials; properties and uses of non-renewable and recycled materials; energy efficient design and green material selection; life cycle cost analysis. Constructability. Aesthetics. Infrastructure management, inventory, assessment/monitoring, performance and remaining service life. Preservation of existing infrastructure; repair and rehabilitation, strengthening and retrofitting to extend service life of structures. Structural composites: properties and applications to improve performance and sustainability of infrastructure.

Civil Engineering 665 **3 units; H(3-0)**

Fundamentals of Soil Behaviour
Principle of effective stress in saturated soil, unsaturated soil and clay. Engineering properties of soils. Shear strength and deformation characteristics of soils in static, cyclic, drained and/or undrained loading. Laboratory testing of soils. One-dimensional consolidation, poro-elastic deformation, swelling mechanism, time-dependent deformation and soil contamination in soils.

Civil Engineering 667 **3 units; H(3-0)**

Applied Rock Engineering
Engineering properties of intact rock and rock mass. Rock classification. Slope and underground excavation; groundwater flow in fractured rock; poro-elastic deformation analysis; hydraulic fracturing.

Civil Engineering 669 **3 units; H(3S-3)**

Permafrost Engineering
Development, characteristics and significance of permafrost, including the thermal and hydrological processes and resulting periglacial geomorphology and geotechnical implications. Contemporary topics in science and engineering of seasonally and perennially frozen ground.

Antirequisite(s): Credit for Civil Engineering 669 and Geography 689 will not be allowed.

Civil Engineering 671 **3 units; H(3-0)**

Advanced Foundation Engineering
Application of geotechnical engineering in the design and analysis of foundations. Includes shallow foundations, deep foundations, earth retaining structures, embankments. Use of bearing capacity theory to calculate ultimate loads. Use of typical elasticity solutions to evaluate settlement. Introduction to Limit State Design. Introduction to the use of geosynthetics to improve soil behaviour in foundation design. Design problems and computer applications in geotechnical foundation engineering.

Civil Engineering 673 **3 units; H(3-0)**

Constitutive Laws for Geomaterials
Definition of a continuous medium. Description of deformable continuous media; concepts of stress, strain and their invariants. Constitutive equations geomaterials as a generic for soil, rock and concrete materials in civil engineering. Review of elasticity theory. Introduction to yielding, plastic flow and failure phenomena in geomaterials. Limit analysis with applications to both geotechnical and structural engineering. Stress-strain behaviour for both cohesive and granular materials. Constitutive models based on critical state theory will be presented. Other topics such as strain localization and fracture phenomena may be included as appropriate.

Civil Engineering 689 **3 units; H(3-0)**

Advanced Project Management Practices and Principles
Advanced practices, tools and concepts in managing complex volatile or large projects. SMART project management based on best practices in diverse industries forms the basis of this course.

Prerequisite(s): Civil Engineering 691, 697 and consent of the Program Director.

Civil Engineering 691 **3 units; H(3-0)**
(Business and Environment 691)

Fundamentals of Project Management
Application of management principles to the project environment; planning, control, scope, time and cost processes; project organization and human resource issues. Students review aspects of a current major capital project and submit and defend a project report.

Prerequisite(s): Consent of the Program Director.

Civil Engineering 693 **3 units; H(3-0)**

Project Engineering Management
Role of the engineering manager in the project management team. The engineering firm, its organization and function; project development, engineering project control; design control; scope and estimate control; engineering interfaces with procurement and construction; engineering responsibility in project commissioning start-up and operations.

Prerequisite(s): Consent of the Program Director.

Civil Engineering 695 **3 units; H(3-0)**

Project Construction Management
Role of the construction manager in the project management team; project options for the management of construction; managing the contractor's business; labour relations; claims; contractor(s) responsibility in project commissioning start-up and operations.

Prerequisite(s): Consent of the Program Director.

Civil Engineering 697 **3 units; H(3-0)**

Project Planning and Control
Strategic and tactical planning; planning for scope, quality, time and cost; selection and implementation of project management information system; economic and risk analysis; planning for construction labour relations.

Prerequisite(s): Consent of the Program Director.

Civil Engineering 699 **3 units; H(3-0)**

Law for Project Managers
Legal issues related to the effective management of projects. Introduction to the legal system and processes; environmental law; intellectual property non-disclosure; professional liability; contract law; strategic alliances; employment law; the builder's

lien act. Cases are reviewed and students are expected to complete a number of assignments requiring research into case law.

Prerequisite(s): Consent of the Program Director.

Note: This course may not be taken for credit towards the JD or LLM degrees.

Civil Engineering 707 3 units; H(3-0)

Theory of Transport Demand Modelling
Modelling for transport planning; data in transport modelling; trip generation modelling; trip distribution modelling; modal split modelling; direct demand models; traffic assignment; equilibrium in transport modelling; discrete-choice models; specification and estimation of logit models; aggregation issues; simplified transport demand models; model updating and transferability.

Prerequisite(s): Consent of the Department.

Civil Engineering 709 3 units; H(2-4)

Practice of Transport Demand Modelling
Sample enumeration modelling; practical aspects of logit model estimation and calibration; disaggregate choice behaviour data; practical four-step transport demand modelling using conventional software packages; application of computer-based network assignment models.

Prerequisite(s): Civil Engineering 707.

Civil Engineering 711 3 units; H(3-0)

Advanced Analysis and Modelling of Public Transit Systems
Role of public transport in a city; concepts of public and private benefits; economies of scale; main modes of urban public transport systems: rail, bus, van and other vehicles; advanced mathematical modelling of mode of operation, route alignment, access, station and stop location, transfer protocols, time table, vehicle and fleet size, reliability; concepts of utility and value of time; detailed functional design and optimization of a bus route, rail line; bus, rail and metro networks.

Prerequisite(s): An undergraduate degree in engineering or instructor approval.

Civil Engineering 715 3 units; H(3-0)

Transport Economics
Economic characteristics of transport; movement and location; transport demand; direct costs of transport; the value of travel time; external costs of transport; shadow prices; pricing of transport services; containment of external costs of transport; private and public sector investment analysis in transport; transport and economic development; transport policy.

Prerequisite(s): Consent of the Department.

Civil Engineering 717 3 units; H(3-0)
(formerly Civil Engineering 703)

Dynamic Traffic Flow and Network Modelling
Fundamental traffic flow characteristics; moving bottlenecks and standing queues; macroscopic traffic flow models, shockwave theory and queuing theory; Traffic instabilities such as capacity drop, wide moving jams and hysteresis loops; Higher order traffic models; Microscopic models (i.e. car-following models); Static assignment including the concepts of user equilibrium and system optimum, shortest path and Braece paradox; Formulation of traffic assignment as a mathematic programming and solution algorithm; Basic concepts of dynamic traffic assignment including dynamic network loading and route choice; advanced traffic management with particular emphasis on advanced traffic management and control and discussion of microscopic simulation models.

Prerequisite(s): Consent of the Department.

Civil Engineering 741 3 units; H(3-0)
(Environmental Engineering 663)

Biological Processes for Wastewater Treatment
Specialized biological wastewater treatment processes for removal of impurities not effectively removed by conventional secondary wastewater treatment systems, such as nutrients (e.g. nitrogen and phosphorus), residual organics, residual solids, bacteria and viruses. Wetlands. Activated sludge modelling. Biological nutrient removal. Sludge management. Disinfection.

Note: Credit for Civil Engineering 741 and Environmental Engineering 663 will not be allowed.

Civil Engineering 745 3 units; H(3-0)
(Environmental Engineering 655)

Hazardous Waste and Contaminated Sites Management
Integrated waste management. Functional and fundamental properties of hazardous waste. Toxicological properties of contaminants. Contaminant release mechanisms. Fate and transport of contaminants in the environment. Contaminated site assessment principles. Quantitative human health risk assessment (QHHRA) as applied to contaminated sites. Hazard identification, exposure pathway analysis, risk characterization. Risk management and site remediation. Methods of hazardous waste treatment and contaminated site remediation. Secure land disposal of hazardous waste and contaminated soils and sludges.

Note: Credit for Civil Engineering 745 and Environmental Engineering 655 will not be allowed.

Civil Engineering 747 3 units; H(3-0)
(Environmental Engineering 653)

Contaminated Soil Remediation
Overview of soil remediation engineering. Contaminant partitioning in air, water and gas phases. Phases of site assessments, Physical and chemical treatment processes, soil vapour extraction, air sparging, soil washing, soil flushing, thermal desorption and incineration, solidification and stabilization, vitrification, biological treatment processes, bioremediation kinetics, ex situ and in situ techniques. Liquid phase bioremediation as it pertains to soil remediation.

Note: Credit for Civil Engineering 747 and Environmental Engineering 653 will not be allowed.

Civil Engineering 749 3 units; H(3-0)

Environmental Aspects of Waste Disposal Systems
Soil-chemical interactions and implications in waste disposal system design; landfill design principles; leachate production, leachate migration in the unsaturated/saturated zones; analytical and numerical solution of flow and transport equations; applications and case studies of groundwater contamination; design and construction of barrier systems; bioreactor landfills; landfill closure issues; greenhouse gas control systems.

Note: Credit for Civil Engineering 749 and Environmental Engineering 651 will not be allowed.

Civil Engineering 751 3 units; H(3-0)

Snow Avalanche Hazard Mitigation
Avalanche motion and protection including avalanche terrain, frictional flow, impact pressures, avalanche risk for fixed structures, elements of structural defence, and run-out estimation based on statistical models, dynamic models, air photo interpretation, field studies of vegetation and historical records.

Civil Engineering 753 3 units; H(3-0)

Snow Avalanche Formation and Release
Snowpack properties and processes including meteorological and ground effects on the snowpack, energy balance at the snow surface, snowpack stratigraphy, metamorphism of snow grains, bonding, as well as spatial and temporal variability of the snowpack. Avalanche initiation including deformation and failure of weak layers, models of slab failure and fracture propagation. Concepts of snow stability, avalanche forecasting and avalanche risk for recreationists.

Communication and Culture CMCL

Instruction offered under the direction of the Department of Communication, Media and Film Studies.

Senior Courses

Communication and Culture 301
3 units; H(2-1T)

Culture Foundations
A critical and inter-disciplinary examination, via classic texts, of the Greco-Roman and Judaeo-Christian Heritage of Western Civilization. Focus will be on major ideas, principles, and their implications within the time-frame of the Ancient and Medieval periods (i.e., 3000 B.C. - 1350 C.E.) and in comparison with non-Western traditions.

Antirequisite(s): Credit for Communication and Culture 301 and General Studies 300 will not be allowed.

Communication and Culture 303
3 units; H(2-1T)

Roads to Modernity
A critical and inter-disciplinary examination, via classic texts, of how the Greco-Roman and Judaeo-Christian traditions were transformed into the Modern West. Focus will be on the major ideas, principles, and their implications within the time-frame of the Early Modern Period (1350-1790) and in comparison to non-Western traditions.

Prerequisite(s): Communication and Culture 301.

Antirequisite(s): Credit for Communication and Culture 303 and General Studies 300 will not be allowed.

Communication and Culture 501 3 units; H(3-0)

Modernity
A critical and inter-disciplinary examination, via classic texts, of the meaning of Modernity in Western and non-Western contexts. Focus will be on the major ideas, principles, and their implications within the time frame of the nineteenth and twentieth centuries.

Prerequisite(s): 48 units (8.0 full-course equivalents).

Antirequisite(s): Credit for Communication and Culture 501 and General Studies 500 will not be allowed.

Communication and Culture 503 3 units; H(3-0)

Contours of Contemporary Culture
A critical and inter-disciplinary examination, via classic texts, of how modernity has been transformed within the framework of an evolving global culture. Focus will be on the major ideas, principles, and their implications within the time-

frame of the middle twentieth to early twenty-first centuries.

Prerequisite(s): 48 units (8.0 full-course equivalents).

Antirequisite(s): Credit for Communication and Culture 503 and General Studies 500 will not be allowed.

Communication and Culture 507
3 units; H(3S-0)
(formerly General Studies 507)

Collaborative Learning and Peer Mentoring
Students will become familiar with learning theories and learning processes, and will receive practical experience by helping learners in a University of Calgary undergraduate course under the supervision of that course's instructor. Activities may include facilitating discussion in classrooms or online, discussing topics for term papers, organizing and assisting study groups, or coaching peers in their oral presentation or writing skills.

Prerequisite(s): 48 units (8.0 full-course equivalents) and consent of the Department of Communication, Media and Film Studies.

Antirequisite(s): Credit for Communication and Culture 507 and Science 511 will not be allowed.

Note: Prospective students must submit an application to the Department of Communication, Media and Film Studies.

Communication and Culture 509
3 units; H(3S-0)
(formerly General Studies 509)

Research in Peer Mentoring and Higher Learning
Students continue to support peers in their learning processes using a facilitative, collaborative approach. As part of their mentoring hours, students in this course will assist new peer mentors to grow into their roles. Students will conduct a textual and field research project related to their peer mentoring roles.

Prerequisite(s): Communication and Culture 507, or General Studies 507 and consent of the Department of Communication, Media and Film Studies.

Note: Prospective students must submit an application to the Department of Communication, Media and Film Studies.

Graduate Courses

Courses offered by the Graduate Program in the Department of Communication, Media and Film Studies in the Faculty of Arts are now listed in the Communication and Media (COMS) section of the calendar.

Communication and Media Studies COMS

Instruction offered by the Department of Communication, Media and Film Studies in the Faculty of Arts.

Note: Communication and Media Studies (COMS) courses were formerly named Communications Studies (COMS). All are COMS courses and considered equivalent for prerequisite purposes.

Junior Courses

Communication and Media Studies 201
3 units; H(2-1)

Introduction to Communication and Media Studies
A general mapping of the field, with an emphasis on its breadth in the areas of media studies, communication of science and technology, and rhetorical communication. The course also provides a general examination of how Communications Studies emerged during the twentieth century and how the field relates to issues of social and cultural change.

Antirequisite(s): Credit for Communication and Media Studies 201 and Communications Studies 201 will not be allowed.

Communication and Media Studies 203
3 units; H(2-1)

New Media
An introduction to the social, political and cultural aspects of new media. Students will examine the social factors that influence the use of new media, as well as the effects of new media on different spheres of social life. Topics to be examined include the historical development of new media; participatory cultures; copyright and Internet law; creative industries; and surveillance and governance in new media.

Antirequisite(s): Credit for Communication and Media Studies 203 and either Science, Technology, and Society 341 or Communications Studies 203 will not be allowed.

Senior Courses

Communication and Media Studies 313
3 units; H(3-0)

Communication Research Methods
A critical introduction to communication research methods. Students will explore, practice, and critique selected quantitative and qualitative research methods and perspectives on the processes of knowledge production.

Prerequisite(s): Communication and Media Studies 201 or Communications Studies 201 or admission to Bachelor of Film Studies.

Antirequisite(s): Credit for Communication and Media Studies 313 and any of Communications Studies 313, Communication and Culture 313, General Studies 313, Development Studies 407, Northern Planning and Development Studies 407 or Women's Studies 313 will not be allowed.

Note: Students are recommended to take Communication and Media Studies 313 in their second year.

Communication and Media Studies 363
3 units; H(3-0)

Professional and Technical Communication
An introduction to professional and technical communication in diverse media. Students will learn the rhetorical dimensions of workplace settings as well as the process of planning, composing, and delivering professional and technical communication for various audiences.

Prerequisite(s): 24 units.

Antirequisite(s): Credit for Communication and Media Studies 363 and Communications Studies 363 will not be allowed.

Note: Preference in enrolment is given to Majors and Minors in the Department of Communications, Media and Film Studies, majors in Geography, and students enrolled in the Bachelor of Arts in Communication and Culture, the Haskayne School of Business and the Schulich School of Engineering. Some sections of this course will be offered online.

Communication and Media Studies 369
3 units; H(3-0)

Rhetorical Communication
An introduction to the basic principles of rhetorical theory, criticism and practice. Students will learn rhetorical perspectives on elements of communication such as argumentation, persuasion, audience, situation, genre, and ethics. Students will apply rhetorical theory to the criticism of samples of public communication and will practice their rhetorical skills through in-class activities and assigned writing and oral presentations.

Prerequisite(s): Prerequisite or Corequisite: Communication and Media Studies 201 or Communications Studies 201.

Antirequisite(s): Credit for Communication and Media Studies 369 and either Communications Studies 361 or 369 will not be allowed.

Note: Preference in enrolment is given to Majors and Minors in Communication and Media Studies and the Bachelor of Communication and Media Studies.

Communication and Media Studies 371
3 units; H(2-1)

Critical Media Studies
Emphasizes major critical approaches in communication and media studies with the intent of introducing students to the theoretical foundations of media and mass communication related research. The course explores the contexts in which these theories arose, identifies their major strengths and weaknesses, and provides an appreciation of how critical theory engages the social world through research on communication and media. Areas to be covered include: the problem of communication (Durham, Mattelart, etc.), the culture industry (Adorno, the Frankfurt School), the Canadian school (McLuhan), structuralism and semiotics (Barthes), Cultural Studies (Hall, Williams), postmodernism (Lyotard, Harvey, etc.).

Prerequisite(s): Communication and Media Studies 201 or Communications Studies 201.

Antirequisite(s): Credit for Communication and Media Studies 371 and Communications Studies 371 will not be allowed.

Communication and Media Studies 381
3 units; H(2-1)

Communications History
A general survey of how various communication systems and practices developed through history, and of the social contexts within which they emerged, transformed, and adapted through time. Within this framework, the course examines major technological developments in the history of human communication and uses theory to understand their origins and impacts on social organization and everyday life.

Corequisite(s): Prerequisite or Corequisite: Communication and Media Studies 201 or Communications Studies 201.

Antirequisite(s): Credit for Communication and Media Studies 381 and either Communications Studies 380 or 381 will not be allowed.

Communication and Media Studies 383
3 units; H(3-0)

Introduction to Public Relations
The role of public relations in group communication within and among various sectors of society, including business, government, educational and cultural organizations. Alternative approaches to public relations theory and practice. Canadian examples and case studies will be used where possible, and ethical standards in public relations will be emphasized.

Antirequisite(s): Credit for Communication and Media Studies 383 and either Communications Studies 383 or 483 will not be allowed.

Communication and Media Studies 393
3 units; H(3-0)

Critical Perspectives on Health and Science
Examines the construction and communication of health and science as socio-cultural phenomena and interrogates the ways in which health and science issues are communicated, defined, represented, and framed, particularly within contemporary media.

Prerequisite(s): Communication and Media Studies 201 or Communications Studies 201.

Antirequisite(s): Credit for Communication and Media Studies 393 and either Communications Studies 393 or Science, Technology and Society 421 will not be allowed.

Communication and Media Studies 401
3 units; H(3-0)

Special Topics in Communication and Media Studies
See the Schedule of Classes for current topic(s).

Antirequisite(s): Credit for Communication and Media Studies 401 and Communications Studies 401 will not be allowed.

MAY BE REPEATED FOR CREDIT

Communication and Media Studies 413
3 units; H(3-0)

Advanced Research Methods
An in-depth study of selected methods for social and cultural research. Students will design and carry out empirical research applying these methods.

Prerequisite(s): Communication and Media Studies 313 or Communications Studies 313.

Antirequisite(s): Credit for Communication and Media Studies 413 and Communications Studies 413 will not be allowed.

Note: This course is strongly recommended for students who intend to apply to Honours or graduate programs or to seek employment in research-intensive industries.

Communication and Media Studies 435
3 units; H(3-0)

Mass Communications and Canadian Society
Introduces students to theoretical literature on various aspects of the media, including public policy questions such as the concentration of media ownership, Canadian content requirements, censorship, the role of the media during elections, and the problems and opportunities that might be brought by advances in technology.

Prerequisite(s): Communication and Media Studies 201 or Communications Studies 201 or admission to a Major or Minor in either Canadian Studies or Film Studies.

Antirequisite(s): Credit for Communication and Media Studies 435 and either Communications Studies 435 or 335 will not be allowed.

Communication and Media Studies 463
3 units; H(2-2)

Rhetorical Communication in Online Environments
Rhetorical theory, criticism, production, and editing of professional communication in online environments (organizational websites and blogs, professional uses of social media, project management applications, collaborative writing applications, corporate and community discussion forums and intranets). Experiential learning through team projects that critique and develop an organization's online content.

Prerequisite(s): One of Communication and Media Studies 363, 383, 369, Communications Studies 363, 383, or 369.

Antirequisite(s): Credit for Communication and Media Studies 463 and Communications Studies 463 will not be allowed.

Communication and Media Studies 469
3 units; H(2-2)

Rhetorical History and Criticism
A study of rhetorical thought and action from selected periods, cultures, and authors from the classical period to the modern age, with an emphasis on the interaction between rhetoric and philosophical, social, and political change. Theories will be applied to the criticism of historical and contemporary public communication.

Prerequisite(s): Communication and Media Studies 369 or Communications Studies 369.

Antirequisite(s): Credit for Communication and Media Studies 469 and either Communications Studies 461 or 469 will not be allowed.

Communication and Media Studies 471
3 units; H(3-0)

Audience and Reception
Approaches the communications process from the point of view of the audience. Students will be introduced to the history of media research dealing with the public and the audience, and consider the changes in theoretical and research paradigms from administrative approaches to those centred on fan practices and subcultures. Topics may include public opinion, uses and gratifications, reception theory, constructivism, shopping, consumption and subjectivity, fan cultures, experiential marketing, and culture jamming.

Prerequisite(s): Communication and Media Studies 371 or Communications Studies 371.

Antirequisite(s): Credit for Communication and Media Studies 471 and Communications Studies 471 will not be allowed.

Communication and Media Studies 473
3 units; H(3-0)

Popular Culture
A Communication and Media Studies approach to the study of popular culture, including music, sport, television, film, comics, literature, gaming, theatre and public performance, the Internet and social networking, fashion, and advertising. Students will be introduced to critical tools for the deconstruction and evaluation of the social and cultural significance of popular cultural texts.

Prerequisite(s): Communication and Media Studies 371 or Communications Studies 371.

Antirequisite(s): Credit for Communication and Media Studies 473 and Communications Studies 473 will not be allowed.

Communication and Media Studies 475
3 units; H(3-0)

Media and Cultural Industries
Considers the role and nature of media and cultural industries, offering students understanding of their role in the production and circulation of popular culture and information. Among those industries that could be examined are television, radio, newspapers and other print media, film, sound recording, book publishing and advertising.

Prerequisite(s): Communication and Media Studies 371 or Communications Studies 371.

Antirequisite(s): Credit for Communication and Media Studies 475 and Communications Studies 475 will not be allowed.

Communication and Media Studies 477
3 units; H(3-0)

Food Culture and Communication
A theoretical and experiential introduction to food cultures as processes and products of communication. Students will examine how food is constructed and represented through text, film, television, art, and tourism. Political and economic constructions of food culture, security, and sustainability will also be explored.

Antirequisite(s): Credit for Communication and Media Studies 477 and either Communications Studies 401.03 or 477 will not be allowed.

Note: This course may involve off-campus field trips during class time, and students are responsible for transportation arrangements and costs. Alternatively, the course may be packaged along with others as part of a Study Abroad opportunity requiring an application and pre-term study and preparation. Contact the instructors or the University of Calgary Study Abroad program for more information.

Communication and Media Studies 481
3 units; H(3-0)

Advanced Topics in New Media and Society
Examines the nature, origins and social implications of new media with a focus on the Internet. Evolving forms of interpersonal, group and public communication based on the Internet will be assessed in terms of the role they play in identity formation, cultural integration, learning, political participation, commerce and work.

Prerequisite(s): One of Communication and Media Studies 371, 381, Communications Studies 371, 381 or Science, Technology and Society 341.

Antirequisite(s): Credit for Communication and Media Studies 481 and Communications Studies 481 will not be allowed.

Communication and Media Studies 491
3 units; H(3-0)

Introduction to Acoustic Communications and Acoustic Ecology
Concepts, techniques and applications of the fields of Acoustic Communications (the ways in which speech and music convey meaning) and Acoustic Ecology (the effects of sound in natural and human environments). These interdisciplinary areas weave together communication theory, cognitive psychology, sociology, musicology, physical sciences, health sciences and aesthetics.

Antirequisite(s): Credit for Communication and Media Studies 491 and either Communications Studies 391 or Communication and Media Studies 401.12 will not be allowed.

Note: There is no scheduled tutorial or lab, but some field work (off campus) and research out of class time is required.

Communication and Media Studies 501
3 units; H(3-0)

Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Communication and Media Studies 501 and Communications Studies 501 will not be allowed.

Note: Students who wish to propose a topic must secure a supervisor and have the topic approved by the Department at least two weeks prior to the first day of classes.

MAY BE REPEATED FOR CREDIT

Communication and Media Studies 503
3 units; H(3-0)

Advanced Special Topics in Communication and Media Studies
Advanced special topics in Communication and Media Studies.

Prerequisite(s): Communication and Media Studies 201 and one of 369, 371, 381 or 393; or Communications Studies 201 and one of 369, 371, 381 or 393.

Antirequisite(s): Credit for Communication and Media Studies 503 and Communications Studies 503 will not be allowed.

MAY BE REPEATED FOR CREDIT

Communication and Media Studies 505
3 units; H(0-3S)

Communication and Media Studies Research Project
An inquiry-based course focused on an advanced exploration of, and apprenticeship in, research within the field. Students will apply and deepen their understanding of topic-specific theories and methods learned at the 400 level. Discussion of research communication will include communication to the public, within organizations, and to academic audiences.

Prerequisite(s): One of Communication and Culture 313 or Communication and Media Studies 313 or Communications Studies 313; and one of Communication and Media Studies 369, 371, 381, 393, Communications Studies 369, 371, 381, or 393.

Antirequisite(s): Credit for Communication and Media Studies 505 and Communications Studies 505 will not be allowed.

Communication and Media Studies 507
3 units; H(0-4)

Experiential Learning in Communications and Media
Supervised individual study through guided experiential learning. Provides students with the opportunity to combine interests in communications research and theory with experiential learning opportunities in an organization or university unit. Involves a communication-related placement or project that engages students in critical reflection on community experience in the context of their formal education.

Prerequisite(s): Communication and Media Studies 201 or Communications Studies 201; and one additional course labelled Communication and Media Studies or Science, Technology and Society 341, 421, and admission to a majors or minor program in the Department of Communication, Media and Film and consent of the Department.

Antirequisite(s): Credit for Communication and Media 507 and either Communications Studies 407 or 507 will not be allowed.

Note: Students should contact the Department of Communication, Media and Film Studies at least two weeks prior to the first day of classes to arrange an independent study course.

Communication and Media Studies 580
6 units; F(0-3)

Advanced BCMS/BFS Project
An advanced research project incorporating both scholarly bibliographic techniques and research techniques appropriate to media production. The project will be produced in a medium appropriate to the student's specialization: print, radio, television, video, film, or multimedia.

Prerequisite(s): Admission to the Bachelor of Communication and Media Studies program or Bachelor of Film Studies program. One of Communication and Media Studies 369, 371, 381 or one of Communications Studies 369, 371, 381 or one of Film 321, 323, 331 or 333; and first year of SAIT Communication Arts diploma program or equivalent.

Antirequisite(s): Credit for Communication and Media Studies 580 and Communications Studies 580 will not be allowed.

Note: Offered jointly by the University of Calgary and the Southern Alberta Institute of Technology. Students must present their diploma transcript to the Arts Students' Centre for consent to register in this course. An unofficial transcript will suffice.

Communication and Media Studies 590
6 units; F(3S-0)

Honours Thesis
Supervised individual research and preparation of an Honours thesis.

Prerequisite(s): Communication and Media Studies 313 or Communications Studies 313 and admission to the Honours Program.

Antirequisite(s): Credit for Communication and Media Studies 590 and either Communication and Culture 590 or Communications Studies 590 will not be allowed.

Communication and Media Studies 591
3 units; H(3S-0)

Senior Seminar in Communication and Media
With reference to a special topic, this course explores the variety of ways in which communication builds social and cultural values. Students will undertake a major project that will integrate their understanding of communication theory, history and methodology. See individual course outlines for current topics.

Prerequisite(s): 78 units, including Communication and Media Studies 313, 369, 371, 381, or Communications Studies 313, 369, 371, 381, and admission to the BA in Communication and Media Studies.

Antirequisite(s): Credit for Communication and Media Studies 591 and Communications Studies 591 will not be allowed.

Graduate Courses

These courses are offered by the Graduate Program in the Department of Communication, Media and Film Studies in the Faculty of Arts.

Note: Not all courses will be offered each year. Registration is open to graduate students admitted into the program. All other students require consent of the Department's Graduate Program Director.

Communication and Media Studies 601
3 units; H(3S-0)
(formerly Communication and Culture 601)

Interdisciplinary Approaches to Communication and Media Studies
An overview of theories, problematics and approaches in communication and media.

Antirequisite(s): Credit for Communication and Media Studies 601 and either Communications Studies 601 or Culture and Society 601 will not be allowed.

Communication and Media Studies 603
3 units; H(3S-0)
(formerly Communication and Culture 603)

Critical Media Studies
Theories and perspectives in the study of media production, industries, genres, and reception.

Antirequisite(s): Credit for Communication and Media Studies 603 and Communications Studies 603 will not be allowed.

Communication and Media Studies 605
3 units; H(3S-0)
(formerly Communication and Culture 605)

Organizational Communication
An examination of the application of theory and methodology of administrative communication processes in complex organizations.

Antirequisite(s): Credit for Communication and Media Studies 605 and Communications Studies 605 will not be allowed.

Communication and Media Studies 607
3 units; H(3S-0)
(formerly Communication and Culture 607)

Socio-Cultural Approaches to Communication and Media Studies
Theoretical perspectives on communication and culture as symbolic processes that produce and reproduce shared meanings, social practices, and social structures.

Antirequisite(s): Credit for Communication and Media Studies 607 and Communications Studies 607 will not be allowed.

Communication and Media Studies 609
3 units; H(3S-0)
(formerly Communication and Culture 609)

Communication Law
An examination of the operation of Canadian law as it relates to the areas of telecommunications, broadcasting and other media.

Antirequisite(s): Credit for Communication and Media Studies 609 and Communications Studies 609 will not be allowed.

Communication and Media Studies 613
3 units; H(3S-0)
(formerly Communication and Culture 613)

Communication and Cultural Theory
An examination of the major perspectives in communication and cultural theory through a historical analysis of classic works and an overview of contemporary approaches and applications.

Antirequisite(s): Credit for Communication and Media Studies 613 and either Communications Studies 613 or Culture and Society 613 will not be allowed.

Communication and Media Studies 615
3 units; H(3S-0)
(formerly Communication and Culture 615)

Research Methods
A survey of research methods appropriate to the study of communication and media.

Antirequisite(s): Credit for Communication and Media Studies 615 and Communications Studies 615 will not be allowed.

Communication and Media Studies 617
3 units; H(3S-0)
(formerly Communication and Culture 617)

Representation and Identity
An investigation of various issues related to representation and identity, including but not limited to race, ethnicity, gender and sexuality.

Antirequisite(s): Credit for Communication and Media Studies 617 and Culture and Society 603 will not be allowed

Communication and Media Studies 619
3 units; H(3S-0)
(formerly Communication and Culture 619)

Communications and Cultural Industries
An analysis of the governmental and social contexts which inform the current development of telecommunications, communications, cultural industries and new media in Canada.

Prerequisite(s):

Antirequisite(s): Credit for Communication and Media Studies 619 and Communications Studies 619 will not be allowed.

Communication and Media Studies 623
3 units; H(3S-0)
(formerly Communication and Culture 623)

Social Contexts of Science and Technology
Theoretical perspectives for understanding central debates in the study of science and technology in their social, political, cultural, and communication contexts.

Communication and Media Studies 625
3 units; H(3S-0)
(formerly Communication and Culture 625)

Interpersonal and Small Group Communication
An examination of theory and research concerning communication processes in face-to-face and small group interaction. Provides opportunities to develop effective practical skills.

Communication and Media Studies 627
3 units; H(3S-0)
(formerly Communication and Culture 627)

Media and Politics
An examination of political communication in traditional and new media, focusing on the interrelationships of media, political thought, and behaviour.

Antirequisite(s): Credit for Communication and Media Studies 627 and Communications Studies 627 will not be allowed.

Communication and Media Studies 629
3 units; H(3S-0)
(formerly Communication and Culture 629)

Communication Management
An examination of communication management in business organizations. Looks at such topics as marketing, public relations and advertising in the context of rapidly changing business environments.

Antirequisite(s): Credit for Communication and Media Studies 629 and Communications Studies 629 will not be allowed.

Communication and Media Studies 631
3 units; H(3S-0)
(formerly Communication and Culture 621)

Social and Media Activism
A critical overview of how digital media are being taken up by social justice movements and the implications of these new media practices in relation to politics and activism.

Antirequisite(s): Credit for Communication and Media Studies 631 and Culture and Society 607 will not be allowed.

Communication and Media Studies 641
3 units; H(3S-0)
(formerly Communication and Culture 641)

Intercultural and International Communication
An examination of cultural/communication issues and practices in Canadian and international contexts. Examines the role of media systems in processes of culture, development, and identity formation.

Antirequisite(s): Credit for Communication and Media Studies 641 and Communications Studies 641 will not be allowed.

Communication and Media Studies 711
3 units; H(3S-0)
(formerly Communication and Culture 711)

Directed Studies
A research project under the direction of a faculty member.

Antirequisite(s): Credit for Communication and Media Studies 711 and Communications Studies 711 will not be allowed.

MAY BE REPEATED FOR CREDIT

Communication and Media Studies 713
3 units; H(3S-0)
(formerly Communication and Culture 713)

PhD Theory Seminar
A seminar that enables PhD students to focus their research interests and to explore theories relevant to their areas of specialization.

Antirequisite(s): Credit for Communication and Media Studies 713 and Communications Studies 713 will not be allowed.

Note: Open only to PhD students in Communication and Media Studies.

Communication and Media Studies 717
3 units; H(3S-0)
(formerly Communication and Culture 717)

Selected Topics in Communication, Media and Film
A variety of communication, media and film topics based on faculty expertise.

MAY BE REPEATED FOR CREDIT

Communication and Media Studies 790
6 units; F(0-6)
(formerly Communication and Culture 790)

Master's Project
A full year course required of all MCS students. Students develop a major research project under the supervision of a faculty member, on the basis of their particular interest.

Antirequisite(s): Credit for Communication and Media Studies 790 and Communications Studies 790 will not be allowed.

Community Health Sciences MDCH

Instruction offered by members of the Cumming School of Medicine.

Community Health Sciences 600 3 units; H(3-0)
(formerly Medical Science 644)

Introduction to Community Health Sciences
An introduction to the Department as well as a general orientation to the education and research programs in Community Health.

Prerequisite(s): Must be registered in the Community Health Sciences or Public Health and Preventative Medicine program. Consent of the instructor required for all other students. Not available to Open Studies students.

NOT INCLUDED IN GPA

Community Health Sciences 601 3 units; H(3-0)
(formerly Medical Science 642)

Determinants of Health
Learners will gain an understanding of the determinants of health within a population health framework. The course begins with an introduction to health and world views on how health is constructed. It then examines the determinants of health and population health frameworks through both an historical context and a contemporary analysis as well as key concepts such as the social gradient. The evidence-base for some of the determinants is then presented. The course ends with the implications for the determinants of health construct in analyzing and addressing specific population health problems.

Prerequisite(s): Must be registered in the thesis-based MSc and PhD Community Health Sciences graduate program. Consent of the instructor required for all other students.

Community Health Sciences 602 3 units; H(1-0)
(formerly Medical Science 649.01)

Practicum in Public Health and Preventative Medicine
Clinical or field-based practicum for the Master of Community Medicine Program of the Community Health Sciences graduate program.

Prerequisite(s): Must be registered in the Master of Community Medicine specialization or the Public Health and Preventative Medicine program.

NOT INCLUDED IN GPA

Community Health Sciences 603 3 units; H(1-0)
(formerly Medical Science 649.02)

Practicum in Health Care Epidemiology
Clinical or field-based practicum for the Health Care Epidemiology specialization of the Community Health Sciences graduate program.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program's Health Care Epidemiology specialization.

NOT INCLUDED IN GPA

Community Health Sciences 604 3 units; H(1-0)
(formerly Medical Science 649.03)

Practicum in Community Health Sciences
Clinical or field-based practicum for students in any specialization of the Community Health Sciences graduate program.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program.

NOT INCLUDED IN GPA

Community Health Sciences 610
3 units; H(3-2T)
(formerly Medical Science 643.01)

Biostatistics I: Essentials of Biostatistics
Introduces the fundamental concepts of summarizing data and statistical inference, including graphical displays, hypothesis testing, p-values, and confidence intervals. Specific topics include comparisons of means and proportions, non-parametric tests, correlation and regression, confounding, sample size determination, and power calculations. Additional topics include a brief introduction to analysis of variance and covariance, logistic regression, and analysis of time-to-event data. Students gain hands-on experience analyzing data using STATA statistical software. Although this course uses STATA exclusively, much of the technical knowledge and some of the computing techniques are applicable to any statistical package.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program or Public Health and Preventative Medicine program. Consent of the instructor is required for all other students. Not available to Open Studies students.

Note: There are no formal course prerequisites but good quantitative and mathematical skills are an asset.

Community Health Sciences 611
3 units; H(3-2T)
(formerly Medical Science 643.02)

Biostatistics II: Models for Health Outcomes
Extends the fundamental concepts to modelling health outcomes using modern regression analysis techniques. Logistic and linear regressions, and their extensions, are covered in detail. The rationale, formulation, and statistical assumptions underlying each regression technique are discussed. Methods for selecting and assessing models are included. Additional topics include a brief introduction to models used in the analysis of repeated measures, longitudinal studies, and time-to-event data. STATA statistical software is used to analyze data. Required course for Biostatistics and Epidemiology specializations.

Prerequisite(s): Community Health Sciences 610 or Medical Science 643.01 and registration in the Community Health Sciences graduate program. Not available to Open Studies students.

Note: A graduate level course in (bio)statistics is required for this course.

Community Health Sciences 612
3 units; H(3-2T)
(formerly Medical Science 643.03)

Biostatistics III: Models for Repeated Measures Studies and Time-to-Events Studies
Discusses techniques for analyzing data collected at more than one point in time (repeated measures) and time-to-event (survival) data. Topics include generalized linear models (GLM), generalized additive models (GAM), Poisson regression, generalized estimating equations (GEE), and proportional hazards regression with time-varying covariates. STATA statistical software is used to analyze data.

Prerequisite(s): Community Health Sciences 611 or Medical Science 643.02 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students. Not available to Open Studies students.

Community Health Sciences 620
3 units; H(1S-4)
(formerly Medical Science 731)

Medical Education
The design, planning, teaching and evaluation of courses in the health science disciplines. Practical experience in teaching methods and curriculum development. Intended for graduate students, faculty and resident physicians, and approved for study credit by the College of Family Physicians of Canada.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 621 3 units; H(3-1)
(formerly Medical Science 733)

Research Design and Statistics in Medical Education
Research design and statistical analysis including a broad overview of the variety of methods for research in medical education and related sciences. There is both a theoretical basis in lectures and seminars as well as applied approaches in laboratory exercises. A variety of research tools will be explicated and utilized.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 622 3 units; H(3-0)
(formerly Medical Science 734)

Qualitative Research in Medical Education
Provides an introduction to qualitative methods as adapted for medical education research and evaluation. Designed to focus on the rationale for qualitative research, the appraisal of qualitative research, methods of data collection (e.g. focus groups, interviews, and text), data handling, data analysis and writing a qualitative research proposal. Specific approaches used in qualitative research including: grounded theory, ethnographic designs, phenomenology, action research and discourse analysis will be discussed.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 623 3 units; H(3-0)
(formerly Medical Science 735)

Teaching Methods in the Medical Sciences
Examines traditional and innovative methods used in medical and science education and clinical teaching to enhance student and practitioner knowledge, skills and attitudes. Discussions and presentations will focus on the role of the teacher and teaching strategies that include the lecture, small group teaching, inquiry and problem solving methods, reflective tools, simulation, surgical skills, computer-based instruction, bedside learning, one-on-one teaching and self-directed learning. The content will be presented within the context of contemporary research, practice and educational theory. Participants will be expected to identify, critique literature, and prepare instructional activities that link research and theory to practice.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 624 3 units; H(3-0)
(formerly Medical Science 736)

Medical Education Cognition Principles
Focus on the study of cognition as it relates to medical education. Begins with a broad overview of principles of adult education, including the fundamental theories of cognition, behaviourism, and social learning theory. From this foundation, the course will review key concepts in medical education cognition, including memory, analytical/non-analytical problem solving, and cognitive load theory. Sessions will provide both didactic lecture material and interactive small group discussion.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 625 3 units; H(3-0)
(formerly Medical Science 737)

Curriculum Design and Evaluation in the Medical Sciences
Presents an overview of the key elements of curriculum design and evaluation within the context of contemporary medical education research, learning and teaching theory, and teaching. Through classroom and electronic discussion, reading and assignments, participants will explore learning needs, objectives, the selection of teaching methods, the identification of resources, the implementation and monitoring of curriculum and evaluation.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 626 3 units; H(3-0)
(formerly Medical Science 738)

Meta-Analysis/Systematic Review in Medical Education
To become familiar with the theory, research, and application of meta-analysis/systematic review as it applies to the compilation of studies in education and health care with a focus on the discipline of medicine education. In particular, an emphasis will be placed on the principles of using statistical methods and techniques related to synthesizing studies in the measurement of a pre-determined and appropriate topic of interest to the participant.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 627 3 units; H(3-0)
(formerly Medical Science 739)

Medical Education Measurement
Focuses on the assessment issues related to the measurement of student achievement, competency, and performance in educational settings. The principles of Classical Test Theory, Item Response Theory, and Generalizability Theory will be introduced and explored through both formal lectures and computer lab activities. Specifically, the course will focus on the measurement issues and concerns related to undergraduate and post-graduate medical education programs.

Prerequisite(s): Must be registered in the Medical Education Specialization of the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 640
3 units; H(3-2T)
(formerly Medical Science 647.01)

Fundamentals of Epidemiology
Principles and methods of descriptive and analytic epidemiology. Emphasizes the underlying concepts and approaches of epidemiological research and critical appraisal of epidemiologic studies including: observational study designs and their vulnerabilities to bias, measures of frequency and association, basic methods for addressing sampling variability, confounding, and effect

modification. Concepts related to causal judgment in epidemiology are also introduced.

Prerequisite(s): Registration in the Community Health Sciences graduate program or Public Health and Preventative Medicine program. Consent of the instructor is required for all other students. Not available to Open Studies students.

Corequisite(s): Community Health Sciences 610 or Medical Science 647.01.

Community Health Sciences 641 3 units; H(3-0) (formerly Medical Science 659.04)

Introduction to Clinical Trials

An introduction to methodological issues in the design and conduct of randomized controlled trials. Topics include ethics, blinding, randomization, sample size determination, sequential designs, data monitoring, and the logistical and organizational aspects of single centre and multi-centre trials.

Prerequisite(s): Community Health Sciences 610 and 640 or Medical Science 643.01 and 647.01 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 642 3 units; H(3-0)

Psychiatric Epidemiology

An overview of the context, principles and methods of psychiatric epidemiology. Basic concepts of bias and random will be applied specifically to problems encountered in conducting psychiatric epidemiological studies. An additional objective is for students to gain a basic understanding of psychiatric terminology and nosology, including a basic understanding of the clinical features of major diagnostic categories.

Prerequisite(s): Community Health Sciences 610 and 640 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students. Not available to Open Studies students.

Community Health Sciences 643 3 units; H(3-0) (formerly Medical Science 647.07)

Research in Health Care Epidemiology and Infection Control

Emphasizes the research aspects of health care epidemiology and the application of basic epidemiologic and biostatistical techniques in the health care environment. The course uses an interdisciplinary approach and fosters the integration of knowledge and skills from the bench to the bedside and back.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 644 3 units; H(3-0) (formerly Medical Science 647.10)

Surveillance I: Data Handling for Infection Control

Focuses on the skills needed for data handling related to Infection Control in various settings. The primary aims are: (1) to develop the skills to properly manage data using various tools and technology; (2) to use basic statistical tools to analyze data used in Infection control; (3) to properly interpret and draw appropriate conclusions from data used in infection control.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Note: This is an online course.

Community Health Sciences 645 3 units; H(3-0) (formerly Medical Science 647.11)

Surveillance II: Principles of Surveillance

Focuses on the practice of surveillance for Infection Prevention and Control in various settings. The primary aims are: (1) to be able to base surveillance on an appropriate rationale; (2) to understand and use various methods of surveillance; (3) to make recommendations and follow up on the results of surveillance; (4) to be able to evaluate a surveillance program and incorporate into quality improvement.

Prerequisite(s): Community Health Sciences 644 or Medical Science 647.10 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Note: This is an online course.

Community Health Sciences 646 3 units; H(3-0) (formerly Medical Science 647.12)

Introduction to Public Health Surveillance

Surveillance is a public health function. Topics included in this online course include definition and overview of public health surveillance, indicators, frameworks and principles for the planning and evaluation of surveillance systems; analysis and interpretation of surveillance data; communication of public health information; and legal and ethical issues relevant to surveillance systems.

Prerequisite(s): Community Health Sciences 610 and 640 or Medical Science 643.01 and 647.01 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 647 3 units; H(3-0) (formerly Medical Science 647.15)

Clinical Epidemiology

Designed for students who have some familiarity and experience in epidemiology, biostatistics and who have a background in clinical health care or related field. It focuses on the application of epidemiologic methods to clinical health issues.

Prerequisite(s): Community Health Sciences 610 and 640 or Medical Science 643.01 and 647.01 and registration in the Community Health Sciences graduate program with a clinical background. Consent of the instructor is required for all other students.

Community Health Sciences 648 6 units; F(3-1.5) (formerly Medical Science 660)

Online Basic Infection Control

Focuses on providing novice Infection Control Professionals (ICPs) with the basic knowledge, tools and strategies needed to do Infection control in a board range of health care environments from health care institutions to the community. The purpose of this entry to practice course is (1) to identify and describe the scope of infection prevention and control problems and issues for novice ICPs and (2) to examine and integrate their current expertise with the basic knowledge, tools and strategies needed to examine problems and develop practical solutions in Infection Control.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Note: This is an online course.

Community Health Sciences 649 3 units; H(3-0) (Medical Science 613.01)

Epidemiology of Infectious Diseases

Focuses on the principles of epidemiology that are of particular relevance to infectious diseases. The course emphasizes the research aspects of infectious diseases epidemiology and how the basic techniques of epidemiology and biostatistics are applied in the communicable diseases.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 660 3 units; H(3-0) (formerly Medical Science 645.18)

Foundations of Health Services Research

An introduction to the fundamental concepts of health services research including topics related to health systems and methods in health services research, as well as evaluation of health systems performance, with emphasis on knowledge translation and health policy creation and analysis.

Prerequisite(s): Must be registered in the Community Health Sciences Graduate Program. Consent of the instructor is required for all other students.

Community Health Sciences 661 3 units; H(3-0) (Economics 679) (formerly Medical Science 679)

Health Economics I

Application of basic concepts from economics to examination of health and health care policy issues, such as why we have the kind of health care system we have, various aspects of health care reform, promotion of health, and evaluation of interventions.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 662 3 units; H(3-0) (formerly Medical Science 659.08)

Economic Evaluation

Designed for students interested in being able to critically interpret economic evaluation studies of health or health care interventions and beyond. The aim of the course is to introduce students to the concepts and methods of economic evaluation, provide an introduction to how it may serve as a useful tool in health and health care decision-making, and to enable students to critically appraise the economic evaluation literature.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 663 3 units; H(3-2) (formerly Medical Science 659.06)

Decision Analysis in Health Economic

Students will be introduced to the concepts of decision analysis and how it may serve as a useful tool in health care economics evaluation. Through attention to a clinical question or health care policy issue, students will develop the skills necessary to perform an economic evaluation to address it.

Prerequisite(s): Community Health Sciences 662 or Medical Science 659.08 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 664 3 units; H(3-0) (formerly Medical Science 659.07)

Administrative Data Analysis Methodology

Administrative data have been used widely for decision making and research. Analysis of the data requires knowledge of the data features and unique analytical skills since the data are not collected for research purposes. This course is designed to provide these skills. Through analyzing available administrative data, students will write

manuscripts suitable for publications at peer-reviewed journals.

Prerequisite(s): Minimum grade of "B+" in Community Health Sciences 610 and 640 or Medical Science 643.01 and 647.01 and consent of the instructor.

Note: Consent of the instructor must be obtained by September 30.

Community Health Sciences 665 3 units; H(3-0) (formerly Medical Science 645.10)

Leadership in Health Care Organizations
A foundation for developing management and leadership skills in health care organizations. The curriculum includes: fundamentals of leadership; formal and informal components of organizations; strategic, operational, financial and project planning; managing change and conflict; human resources; and evaluating organizational performance. A variety of learning opportunities are incorporated including: reading materials, student seminars, self-assessment tools, case studies, team assignments, guest speakers and class discussion.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 666 3 units; H(3-0) (formerly Medical Science 645.15)

Health Policy
An advanced level course focused on developing and deepening participants' understanding of critical policy issues affecting health and health services. The course will primarily review health policy in the context of Canadian populations and systems. However, a more global comparative frame of reference will be used to test, challenge and contrast both the historical and current underpinnings of health policy in Canadian jurisdictions.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 667 3 units; H(3-0) (formerly Medical Science 645.17)

Introduction to the Legal and Ethical Framework of Health Care in Canada
An introduction to two integrated aspects of health care in Canada: the legal dimensions and the ethical dimensions. No formal background or training in law or ethics is presupposed. Successful students will gain grounding in the ethico-legal complexity of health care and health research in Canada.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 680 3 units; H(3S-0) (formerly Medical Science 651.04)

Foundations of Population/Public Health
Students will learn, discuss, and interrogate foundational content in population health and public health. Foundational content includes history, structure, functions, concepts, theories, and debates. The course is structured with the first half focusing on public health and the second half focusing on population health.

Prerequisite(s): Registration in the Community Health Sciences graduate program or Public Health and Preventative Medicine program. Consent of the instructor is required for all other students.

Community Health Sciences 681 3 units; H(3-2T) (formerly Medical Science 659.02)

Health Research Methods
Introduction to health research, including research design, measurement, data collection, proposal and grant writing.

Prerequisite(s): Community Health Sciences 610 or Medical Science 643.01 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students. Not available to Open Studies students.

Community Health Sciences 683 3 units; H(3-0) (formerly Medical Science 659.05)

Qualitative Health Research
A focus on interpreting published examples of qualitative health research as well as qualitative data relevant to health. The importance of both methods and theories for sound interpretation will be emphasized. Examples relevant to people's experiences of health services as well as influences on population health outcomes other than health services and technologies will be considered.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 687 3 units; H(3-0) (formerly Medical Science 651.06)

Environmental Health
Examination of the interaction between natural and man-made environments in human health/illness.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program or the Public Health and Preventative Medicine program. Consent of the instructor is required for all other students.

Community Health Sciences 689 3 units; H(3-0) (formerly Medical Science 651.08)

Global Health and Development
An examination of health, the determinants of health, and approaches to health policy and programming in the context of less developed country populations. The course provides an overview of the history and evolution of primary health care and the role of health in development and examines current trends and issues related to global development. Cross-cutting themes include: international perspectives and trends in health sector reform, globalization, policy programming and financing, public participation in decision making, governance, health human resources, gender, human rights, partnerships and information-education-communication among others.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 700 3 units; H(1-6)

Community Health Directed Study
Independent study in special topics at an advanced level in Community Health Sciences.

Prerequisite(s): Consent of the instructor.

MAY BE REPEATED FOR CREDIT

Community Health Sciences 710 3 units; H(3-0) (formerly Medical Science 712.01)

Advanced Topics in Biostatistics
Advanced topics and methods used in Biostatistics.

Prerequisite(s): Consent of the instructor.

Community Health Sciences 720 3 units; H(2-3)

Pro Doctoral Seminar
Pertinent topics discussed to prepare students for thesis preparation.

Community Health Sciences 740 3 units; H(3-2T) (formerly Medical Science 709)

Advanced Epidemiology
An expansion on the understanding of causality and threats to validity in epidemiologic research. The focus will be on the assessment and control of bias, including selection, information and confounding. The concept of effect modification (interaction) will be appraised. Stratified analysis will be considered as a tool for the assessment and control of confounding and effect modification and will be applied to a variety of study designs including case-control, and cohort studies.

Prerequisite(s): Community Health Sciences 640 or Medical Science 647.01 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 741 3 units; H(3-0) (formerly Medical Science 711)

Systematic Reviews and Meta-Analysis
An exposure to all steps involved in the conduct of a systematic review and meta-analysis.

Prerequisite(s): Community Health Sciences 610 or Medical Science 643.01 and Community Health Sciences 640 or Medical Science 647.01 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 742 3 units; H(3-0) (formerly Medical Science 712.02)

Advanced Topics in Epidemiology
Advanced topics and methods used in Epidemiology.

Prerequisite(s): Community Health Sciences 640 or Medical Science 647.01 and consent of the instructor.

Community Health Sciences 760 3 units; H(3-0) (formerly Medical Science 712.03)

Advanced Topics in Health Services Research
Advanced topics and methods used in health services research.

Prerequisite(s): Community Health Sciences 660 or Medical Science 645.18 and consent of the instructor.

Community Health Sciences 761 3 units; H(3-0) (formerly Medical Science 705)

Advanced Methods in Health Research
Advanced health research designs and measurement techniques.

Prerequisite(s): Community Health Sciences 681 or Medical Science 659.02 and registration in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Health Sciences 780 3 units; H(3-0) (formerly Medical Science 712.04)

Advanced Topics in Population/Public Health
Advanced topics and methods used in population/public health.

Prerequisite(s): Community Health Sciences 680 or Medical Science 651.04 and consent of the instructor.

Community Rehabilitation CORE

Instruction offered by members of the Community Rehabilitation and Disability Studies interdisciplinary team.

Junior Courses

Community Rehabilitation 205
3 units; H(2-1T-2)

Introduction to Disability Studies
The social, political, economic, health and advocacy systems that support and empower persons with disabilities and their families.

Community Rehabilitation 207 3 units; H(2-1T-2)

Introduction to Community Rehabilitation
Assessments, interventions and working partnerships within a lifespan perspective.

Community Rehabilitation 209 3 units; H(3-0)

Disability in Theory and Everyday Life
Lifespan exploration of theory, research directions, and lifeworks of those affected by disability.

Senior Courses

Community Rehabilitation 307 1.5 units; Q(1-1)

Community Rehabilitation Practice Strategies
307.01. Lifespan Approach to Disabling Conditions

307.02. Assessment Approaches in Community Rehabilitation

307.03. Intervention Models and Strategies in Community Rehabilitation

307.04. Individualized Planning

307.05. Ethics and Issues for Canadian Rehabilitation Professionals

Community Rehabilitation 321 3 units; H(2-1)

Communication Skills in Rehabilitation
A skills-based introduction to understanding and developing basic communication skills that facilitate helpful dialogue in interpersonal, counselling, guidance and community rehabilitation related contexts.

Antirequisite(s): Credit for Community Rehabilitation 321 and 591.43 will not be allowed.

Community Rehabilitation 323 3 units; H(2-1T)

Introduction to Disability Studies
An in-depth view of the meaning and scope of disability studies and its relationship to other fields serving and dealing with disabled people such as community rehabilitation. Also covers the history of disability studies, the international scene of disability studies existing today and present and future challenges and possibilities for disability studies.

Note: This course is intended for diploma transfer students coming from non-disability studies programs.

Community Rehabilitation 415 3 units; H(3-0)

Management and Leadership in Nonprofits
Management and leadership issues within private, non-profit and public community-based organizations and businesses.

Community Rehabilitation 425 3 units; H(3-0)

Social Constructions of Disability and Health
An inquiry-based course on Social Construction, Social Problem Theory and Narrative as foundations for interdisciplinary study, health capacity, community practice and personal empowerment.

Community Rehabilitation 471 3 units; H(3-0)

Community Rehabilitation Practice for Children with Special Needs and Their Families
Cognitive, social and emotional development of children with disabilities in the context of their families, schools and communities.

Community Rehabilitation 473 3 units; H(3-0)

Vocational Rehabilitation and Disability
Vocational rehabilitation principles (return to work issues) when working with persons encountering adult onset disabilities.

Community Rehabilitation 475 3 units; H(3-0)

Community Rehabilitation Practice and the Aging Process
Theoretical and practical issues as they relate to rehabilitation and community services for seniors with disabilities.

Community Rehabilitation 485
3 units; H(2T/2-10)

An Introduction to Community Rehabilitation Practice and Professional Conduct
Practical application of the basic principles of assessment, planning and intervention with individuals/groups. Professional development tutorials support 130 hours in community practicum. Students taking both Community Rehabilitation 485 and 487 will choose a different human service realm for each practicum.

Community Rehabilitation 487
3 units; H(2T/2-10)

Practicum in Rehabilitation Practice
Practical application of the basic principles of assessment, planning and intervention with individuals/groups. Professional development tutorials support 130 hours in community practicum. Students taking both Community Rehabilitation 485 and 487 will choose a different human service realm for each practicum.

Community Rehabilitation 525 1.5 units; Q(1-1)

New Psychologies of Disability
MAY BE REPEATED FOR CREDIT

Community Rehabilitation 531 1.5 units; Q(1-1)

Topics in Inclusive Practice
Offered as part of a Summer Institute in Inclusive Education and an Inclusive Education 4 course specialization.

MAY BE REPEATED FOR CREDIT

Community Rehabilitation 536 3 units; H(3-0)
(formerly Community Rehabilitation 535.01)

Adapting Curriculum in Schools K-12
A variety of practical strategies for developing meaningful curriculum modifications and instructional methods for students with disabilities. The strategies are premised on using collaborative team approaches to planning and implementing instructional programs for students. Involving families as a meaningful part of the learning team will also be emphasized.

Community Rehabilitation 537 3 units; H(3-0)
(formerly Community Rehabilitation 535.03)

Inclusion and Challenging Behaviours
Topics are developed in consultation with the education sector in partnership with provincial advocacy organizations.

Community Rehabilitation 538 3 units; H(3-0)
(formerly Community Rehabilitation 535.02)

Ethics of Inclusion
An examination and expansion of belief systems surrounding challenging behaviour. Participants will be offered opportunities to learn about successful strategies for supporting difficult students within a classroom as well as other settings.

Community Rehabilitation 541 3 units; H(3-0)

Special Topics in International Disability Research and Policy
Selected topics in disability research and policy whereby the student learns to understand and compare the perspective as developed in two or more countries.

Community Rehabilitation 543 3 units; H(3-0)

Integrating the Arts
Principles, theories and applications of creative art techniques with varied populations. Of particular interest to rehabilitation practitioners working with persons who present behavioural challenges.

Antirequisite(s): Credit for Community Rehabilitation 543 and 591.02 will not be allowed.

Community Rehabilitation 545 3 units; H(3-0)

Bioethics and Disability
An in-depth view of the impact of bioethics on social policy, disability studies, disability research and the lives of disabled people.

Antirequisite(s): Credit for Community Rehabilitation 545 and 591.26 will not be allowed.

Community Rehabilitation 547 3 units; H(3-0)

Health Research, Emerging Technologies and Marginalized Groups
An online course that provides an in-depth global outlook on new, envisioned and emerging sciences and technologies and their global impact on (a) disabled people and disability studies; (b) the concept and field of rehabilitation and identity of rehabilitation professionals; (c) the concept of health professionals. Also provides an understanding of how disability studies scholars and rehabilitation and health policy, systems and care delivery scholars and professionals can enrich the new, envisioned and emerging science and technology and governance of science and technology discourse.

Antirequisite(s): Credit for Community Rehabilitation 547 and 591.28 will not be allowed.

Community Rehabilitation 549 3 units; H(3-0)

Understanding Children with Autism
Introduces students to Autism Spectrum Disorders (ASD). Discussions of the biological bases for the disorders as well as historical perspectives will be covered. Current research will be investigated from a variety of perspectives and philosophies. This course will provide students with in-depth knowledge of techniques used to treat children with autism, both empirically validated and those currently in vogue. An overview of characteristics, assessment strategies, issues, and approaches related to children with autism will be provided.

Antirequisite(s): Credit for Community Rehabilitation 549 and 591.30 will not be allowed.

Community Rehabilitation 551 3 units; H(3-0)

Social Role Valorization: A Framework for Practice in Rehabilitation

Social Role Valorization (SRV) theory will be reviewed in the context of values and assumptions for all persons and their place in the community.

Antirequisite(s): Credit for Community Rehabilitation 551 and 591.33 will not be allowed.

Community Rehabilitation 553 3 units; H(3-0)

Health Foundations: Disability Across the Lifespan

Explores the concepts of community rehabilitation in the context of anatomy and physiology of disabling conditions and human development across the lifespan. Self-directed learning is based on case studies, exploring current literature, and online interactive group work and forum discussions.

Antirequisite(s): Credit for Community Rehabilitation 553 and 591.34 will not be allowed.

Community Rehabilitation 555 3 units; H(3-0)

Introduction to Assessment: Planning and Intervention

An online course delivered in asynchronous means. It has been constructed to explore a lifespan perspective on disability through personal narrative, theory and research and provide important elements of theory and application for effective person-centred approaches for practicing community rehabilitation and disability professionals. The intention of this course is for the rehabilitation student/practitioner to experience all aspects of being-in-practice through reflective and mindful utilization of assessment application, intervention models and person-centre planning.

Antirequisite(s): Credit for Community Rehabilitation 555 and 591.35 will not be allowed.

Community Rehabilitation 557 3 units; H(3-0)

Health and Lifestyle: Theory and Practice for CRDS Professionals

Often CRDS professionals are called upon to engage in meaningful/knowledgeable conversations about their client's health and frequently within a cross-disciplinary capacity. Therefore to assist in this process, the intention of this course is to provide the CRDS students with basic theoretical knowledge about human anatomy and physiology. A general understanding of the multiple dimensions of health and how to design health and lifestyle plan designed for the specific needs of their clients. This course will be taught from a collaborative/inquiry learning approach which invites meaningful interprofessional participation that emphasize knowledge into action. As such, to demonstrate through an understanding of basic anatomy and physiology the student becomes conversant with the science, the complexities of health and focused on potential clients.

Community Rehabilitation 559 3 units; H(3-0)

Fetal Alcohol Syndrome and Community Rehabilitation

A disability studies approach to Fetal Alcohol Spectrum Disorder and how this approach can facilitate an understanding of individuals with FASD in view of the principles of community inclusion and social justice as these apply to family support, schooling, intervention, prevention and life-long supports.

Antirequisite(s): Credit for Community Rehabilitation 559 and 591.42 will not be allowed.

Community Rehabilitation 569 3 units; H(3-0)

Recovery Models: Mental Health and Disability

Clinical and interprofessional skills for those working in recovery and consumer driven programs in Community Mental Health and Disability.

Community Rehabilitation 573 3 units; H(3-0)

Disability and the Law

Foundations of Canadian legal principles and practices as they affect community rehabilitation.

Community Rehabilitation 581 3 units; H(3-0)

Professional Practice Issues and Professional Ethics in Community Rehabilitation

Ethical decision-making issues and practices for community rehabilitation service providers, researchers, interdisciplinary teams, agencies and policy developers.

Community Rehabilitation 583 3 units; H(3-1)

Community Development in Community Rehabilitation

A study of practice issues for professionals working in community development and interdisciplinary teams. The course is designed to acknowledge that partnership and community action are key components of rehabilitation practice.

Community Rehabilitation 591 3 units; H(2-1)

Advanced Study Topics in Community Rehabilitation

Advanced study topics in community rehabilitation.

MAY BE REPEATED FOR CREDIT

Community Rehabilitation 593 1.5 units; Q(1-1)

Advanced Study Topics in Community Rehabilitation

Advanced study topics in community rehabilitation.

MAY BE REPEATED FOR CREDIT

Community Rehabilitation 594
3 units; H(2T/2-10)
(formerly Community Rehabilitation 589.01)

Practicum I

Senior level program and management skills in partner agencies, associations and systems. Specifics to be negotiated with the student.

Community Rehabilitation 595
3 units; H(2T/2-10)
(formerly Community Rehabilitation 589.02)

Practicum II

Senior level program and management skills in partner agencies, associations and systems. Specifics to be negotiated with the student.

Community Rehabilitation 596
3 units; H(2T/2-10)
(formerly Community Rehabilitation 589.03)

Reflective Practice for Community of Learners

Retrospective analysis and group discussion of personal clinical practice and program innovation.

Community Rehabilitation 597
3 units; H(2T/2-10)
(formerly Community Rehabilitation 589.06)

Practicum in Community Rehabilitation for Distance Learners

Students will contract with a human service organization for 130 hours to complete a project in the area of program or service development (e.g. needs analysis, developing funding proposals, program evaluation). In the seminars, students will be supported in the completion of agency-based program development. Students will present on a topic relating to their contract. Topics will be selected on the basis of student practicum.

Graduate Courses

Community Rehabilitation 624
6 units; F(3-1S-3)

Specialization Theory and Practice: A Collaborative Inquiry Capstone

Students refine a topic of inquiry, prepare background working papers, invite reactions from stakeholders/experts and report on their experience to stakeholder audience, fellow students and faculty. This is not a research course but an opportunity for students to own their knowledge and find ways to share their experience and education with others in a collaborative manner.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Rehabilitation 630 3 units; H(3-1S)

Foundations and Futures of Disability and Community Studies

History, current issues, and futures of intervention, activism, and academic study related to disability. This will include the systems and changing roles of those traditionally served, professionals, the teams they generate and society.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 630 and 603.15 will not be allowed.

Community Rehabilitation 631 3 units; H(3-1S)

Politics of Inclusion and Exclusion of Disability and Community Studies

Current topics relevant to inclusion and exclusion will be reviewed. An examination of research in disability provides an opportunity for the student to learn, understand, and compare legislation, policy, and ethical frameworks that inform action. Frameworks of choice, respect, consultation, collaboration, and co-operation will be examined.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 631 and 603.12 will not be allowed.

Community Rehabilitation 632 3 units; H(3-0)

Leadership and Innovation

The changing personal, organizational, and societal, leadership role and its importance for innovation in the field of disability and community studies.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 632 and 603.13 will not be allowed.

Community Rehabilitation 633 3 units; H(3-1S)

Social Construction: Health Capacity and Disability

A constructivist exploration of language, political structures, and sense of self to deepen the understanding of health capacity and disability.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 633 and 603.18 will not be allowed.

Community Rehabilitation 634 3 units; H(3-1S)

Appraisal of Social and Health Quantitative Research Methods

Provides students with experience in critically appraising a range of quantitative research methods and familiarize them with a variety of bio-statistical approaches. A variety of frameworks will be used to critically appraise literature from students' chosen field of study and examine and discuss the implications for evidence-based practice.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 634 and 603.16 will not be allowed.

Note: Pre-session requirements include reading of pre-session materials and participation in orientation session prior to online course delivery.

Community Rehabilitation 641 3 units; H(3-0)

Special Topics in International Disability Research and Policy

Selected topics in disability research and policy provide an opportunity for the student to learn, understand, and compare the policies in two or more countries.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Rehabilitation 650 3 units; H(3-0)

Adapting Curriculum and Instruction from K-12

A variety of practical strategies for developing meaningful curriculum and instructional methods for students with severe disabilities. The strategies are premised on using the content of typical community collaborative team approaches to planning and implementing programs for students. Involving parents as part of the Learning Team will be emphasized.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 650 and 691.04 will not be allowed.

Community Rehabilitation 651 3 units; H(3-0)

Challenging Behaviours in the Classroom: Inclusive Education

Examines and builds upon the participant's belief systems about challenging behaviour. Participants will be offered opportunities to learn about successful strategies for supporting difficult students within a classroom setting.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 651 and 691.32 will not be allowed.

Community Rehabilitation 652 3 units; H(3-0)

Collaboration, Ethics, Management: Inclusive Education

Each year a topic is negotiated with the education sector in partnership with provincial advocacy organizations.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 652 and 691.33 will not be allowed.

Community Rehabilitation 653 3 units; H(3-1S)

Advanced Seminar: Assessment and Intervention for Families with Children with Special Needs

Exploration of cognitive, social/emotional, motor, language/communication development and assessment of children with disabilities in the context of their families and communities.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 653 and 603.02 will not be allowed.

Community Rehabilitation 654 3 units; H(3-0)

Health Research, Emerging Technologies and Marginalized Groups

Provides an in depth view of the impact of new emerging technologies and the governance of science and technology and health research on social policy, disability studies, disability research and the lives of disabled people and other marginalized groups.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 654 and 691.42 will not be allowed.

Note: This is an online course.

Community Rehabilitation 655 3 units; H(3-0)

Bioethics and People with Disabilities

Provides an in depth view of the impact of bioethics on social policy, disability studies, disability research and the lives of disabled people.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 655 and 691.44 will not be allowed.

Note: This is an online course.

Community Rehabilitation 656 3 units; H(3-0)

Career Development and Disabilities

Exploration of career development issues such as occupational change, and integration back into the workforce because of disability experienced in adult life.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Antirequisite(s): Credit for Community Rehabilitation 656 and 603.03 will not be allowed.

Community Rehabilitation 676 6 units; F(3-1S-3)

Consultation in Human Services and Systems

Qualitative and quantitative evaluation research informs the design and implementation of a collaborative evaluation of a rehabilitation program, policy or system.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other students.

Community Rehabilitation 730 3 units; H(3S-0)

Doctoral Pro-Seminar in Disability, Community and Rehabilitation

This advanced professional seminar focuses on a critical examination of theoretical, methodological, and professional issues relevant to research in the domains of community rehabilitation and disability studies. The course is intended for PhD students preparing their dissertation research proposals as a final preparation for their Candidacy Exam.

Prerequisite(s): Must be registered in the Community Health Sciences graduate program. Consent of the instructor is required for all other graduate students.

NOT INCLUDED IN GPA

Comparative Literature COLT

Instruction offered by members of the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Junior Course

Comparative Literature 203 3 units; H(3-0)

Comparative World Literature from 1650

Formative texts of world literature from 1650 to the present.

Senior Course

Comparative Literature 399 3 units; H(3-0)

Studies in Comparative Literature

MAY BE REPEATED FOR CREDIT

Computer Engineering ENCM

Instruction offered by members of the Department of Electrical and Computer Engineering in the Schulich School of Engineering.

Senior Courses

Computer Engineering 339 3 units; H(3-1T-1.5)

Programming Fundamentals

Pointers and references, memory models and memory management. Manipulation of text files and binary files. Abstract data types (ADTs): implementation of ADTs as classes. Introduction to recursion.

Prerequisite(s): Engineering 233.

Computer Engineering 369 3 units; H(3-1T-1.5)

Computer Organization

Organization of a simple stored-program computer: CPU, busses and memory. Instruction sets, machine code, and assembly language. Conventions for assembly language generated by compilers. Floating-point number representation. Hardware organization. Address translation and virtual memory. Input/output devices, computer interfacing, interrupt handling and multi-tasking systems.

Prerequisite(s): Computer Engineering 339 and Electrical Engineering 353.

Computer Engineering 467 3 units; H(3-1T-3/2)

Digital Electronic Circuits

MOS transistor fundamentals (D.C. characteristics, large signal model, transient behaviour). Transistor level implementation of standard MOS logic gates. Other MOS logic blocks. MOS memory (static and dynamic). Interfacing various logic families. Introduction to integrated circuit design.

Prerequisite(s): Electrical Engineering 343 and 361.

Computer Engineering 501 3 units; H(3-1T-2/2)

Principles of Computer Architecture

Input/output, processors, intra-system communication, busses, caches. Addressing and memory hierarchies. Microprogramming, parallelism, and pipelining. Classification and taxonomy of

computer architectures. Reduced instruction set computers, pipelining, vector processing, dataflow computers, architecture description languages, firmware engineering.

Prerequisite(s): Computer Engineering 369 and 511.

Computer Engineering 507 3 units; H(3-1T)

Computer Aided Design of Integrated Circuits
Development of Computer-Aided Design (CAD) tools for digital circuits, algorithmic definition and design; partitioning, clustering, placement routing and timing techniques for digital circuits; applications in other areas of engineering.

Prerequisite(s): Electrical Engineering 353.

Antirequisite(s): Credit for Computer Engineering 507 and Electrical Engineering 519.38 will not be allowed.

Computer Engineering 509 3 units; H(3-2)

Fundamentals of Biometric Systems Design
Biometric systems, sensors and devices, Integration of Biometric-based hardware and software, Biometric applications.

Prerequisite(s): Electrical Engineering 327 or consent of the instructor.

Antirequisite(s): Credit for Computer Engineering 509 and 519.36 will not be allowed.

Computer Engineering 511 3 units; H(3-1T-3/2)

Embedded System Interfacing
Review of computer architecture; microcontrollers and their instruction sets; interfacing using common input/output devices, debugging and other software engineering practices, strategies for interrupt handling and exception handling; Interfacing using high level and assembly languages; software and hardware optimizations to achieve real time operations; real time operating systems; Embedded real-time applications.

Prerequisite(s): Computer Engineering 369.

Computer Engineering 515 3 units; H(3-1T-3/2)

Digital Signal Processors
Review of microprocessor fundamentals. Comparison of basic system architectures for RISC, CISC and DSP processors, recent architectural innovations. Processor characteristics needed to match the requirements for typical DSP applications. Hardware and software optimization techniques including multiple busses, register windows, super-scalar and other highly parallel instruction sets, critical timing paths, optimizing compilers and multi-processor operation. Fundamental comparison of custom and current commercial single chip DSP processor architectures. Elements of Hardware-Software co-design and development processes. Practical applications and laboratories.

Prerequisite(s): Computer Engineering 369.

Computer Engineering 517 3 units; H(3-1T)

Computer Arithmetic and Computational Complexity
Analyzing the complexity of computer arithmetic algorithms, fundamental issues concerning computational complexity problems with applications to engineering problems, including signal and image processing, cryptography and data mining.

Prerequisite(s): Computer Engineering 339.

Antirequisite(s): Credit for Computer Engineering 517 and 519.34 will not be allowed.

Computer Engineering 519 3 units; H(3-2)

Special Topics in Computer Engineering
Current topics in computer engineering.

Prerequisite(s): Consent of the Department.

Note: Consult Department for announcement of topics.

MAY BE REPEATED FOR CREDIT

Computer Science CPSC

Instruction offered by members of the Department of Computer Science in the Faculty of Science.

Notes:

Computer Science students should also see courses listed under Software Engineering.

Computer Science 217, 231 and 235 are each introductions to computer science that include a substantial introduction to programming and that are available for credit for Computer Science majors. Students interested in these courses should consult the department and program information for the Department of Computer Science when choosing which course to take.

In several cases, credit is not allowed for Computer Science courses and various courses offered by the Faculty of Engineering. Students who have successfully completed Engineering courses should contact the Department of Computer Science for additional information.

Computer Science 101 0.75 units; E(6 hours)

Introduction to Unix
An introduction to the Unix operating system, including the text editor "emacs," its programming modes and macros; shell usage (including "sh" and "tcsh"); and some advanced Unix commands.

Note: This course is highly recommended as preparation for Computer Science 217 or 231 or 235.

NOT INCLUDED IN GPA

Computer Science 102 1.5 units; Q(12 hours)

Advanced Unix
Unix signals, processes, and file system; interprocess communication; advanced shell programming; program profiling.

Prerequisite(s): Computer Science 219 or 233 or 235.

Note: This course is highly recommended as preparation for students entering the second year of a computer science program.

NOT INCLUDED IN GPA

Computer Science 105 1.5 units; Q(12 hours)

Introduction to the Analysis of Algorithms
Techniques to prove the correctness and measure the efficiency of algorithms.

Prerequisite(s): Computer Science 313 and 319.

Note: This course is intended for students who have completed Computer Science 319, instead of Computer Science 331, who wish to be qualified for senior courses in theoretical computer science.

NOT INCLUDED IN GPA

Junior Courses

Computer Science 203 3 units; H(3-2T)

Introduction to Problem Solving using Application Software
Introduction to computer fundamentals; contemporary topics, such as security and privacy, and the Internet and World Wide Web. Problem solving, analysis and design using application software, including spreadsheets and databases.

Antirequisite(s): Not open to Computer Science majors.

Note: Basic familiarity with personal computers and commonly used software, including word processors, electronic mail and web browsers, will be assumed.

Computer Science 217 3 units; H(3-2T)

Introduction to Computer Science for Multidisciplinary Studies I
Introduction to problem solving, analysis and design of small-scale computational systems and implementation using a procedural programming language. For students wishing to combine studies in computer science with studies in other disciplines.

Antirequisite(s): Credit for Computer Science 217 and any of 215, 231, 235 or Computer Engineering 339 or Engineering 233 will not be allowed.

Note: Computer Science 101 is strongly recommended as preparation for this course. See the statements at the beginning of the Computer Science entry.

Computer Science 219 3 units; H(4-2T)

Introduction to Computer Science for Multidisciplinary Studies II
Continuation of Introduction to Computer Science for Multidisciplinary Studies I. Emphasis on object oriented analysis and design of small-scale computational systems and implementation using an object oriented language. Issues of design, modularization and programming style will be emphasized.

Prerequisite(s): Computer Science 217.

Antirequisite(s): Credit for Computer Science 219 and any of 233, 235, Electrical Engineering 497 or Computer Engineering 493 will not be allowed.

Computer Science 231 3 units; H(3-2T)

Introduction to Computer Science for Computer Science Majors I
Introduction to problem solving, the analysis and design of small-scale computational systems, and implementation using a procedural programming language. For computer science majors.

Antirequisite(s): Credit for Computer Science 231 and any of 215, 217, 235, Computer Engineering 339 or Engineering 233 will not be allowed.

Note: Computer Science 101 is strongly recommended as preparation for this course. See the statements at the beginning of the Computer Science entry.

Computer Science 233 3 units; H(3-2T)

Introduction to Computer Science for Computer Science Majors II
Continuation of Introduction to Computer Science for Computer Science Majors I. Emphasis on object-oriented analysis and design of small-scale computational systems and implementation using an object oriented language. Issues of design, modularization, and programming style will be emphasized.

Prerequisite(s): Computer Science 231.

Antirequisite(s): Credit for Computer Science 233 and any of 219, 235, Electrical Engineering 497 or Computer Engineering 493 will not be allowed.

Computer Science 235 3 units; H(3-2T-2)

Advanced Introduction to Computer Science
An accelerated introduction to problem solving, the analysis and design of small-scale computational

systems and implementation using both procedural and object oriented programming languages. Issues of design, modularization, and programming style will be emphasized.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Computer Science 235 and any of 215, 217, 219, 231, 233, Computer Engineering 339 or 493 will not be allowed.

Note: Computer Science 101 is strongly recommended as preparation for this course. See the statements at the beginning of the Computer Science entry.

Senior Courses

Computer Science 313 **3 units; H(3-2T)**

Introduction to Computability
An introduction to abstract models of sequential computation, including finite automata, regular expressions, context-free grammars, and Turing machines. Formal languages, including regular, context-free, and recursive languages, methods for classifying languages according to these types, and relationships among these classes.

Prerequisite(s): Mathematics 271 or 273; Philosophy 279 or 377; and one of Computer Science 219, 233 or 235.

Note: One of Computer Science 319 or 331 is strongly recommended as preparation for this course.

Computer Science 319 **3 units; H(3-2T)**

Data Structures, Algorithms, and Their Applications
Fundamental data structures, including arrays, lists, stacks, queues, trees, hash tables, and graphs. Algorithms for searching and sorting. Applications of these data structures and algorithms. For students wishing to combine studies in computer science with studies in other disciplines.

Prerequisite(s): One of Computer Science 219, 233, 235 or Computer Engineering 339.

Antirequisite(s): Credit for Computer Science 319 and 331 will not be allowed. This course is not available for credit for Computer Science majors.

Computer Science 329 **3 units; H(3-2T)**

Explorations in Information Security and Privacy
A broad survey of topics in information security and privacy, with the purpose of cultivating an appropriate mindset for approaching security and privacy issues. Topics will be motivated by recreational puzzles. Legal and ethical considerations will be introduced as necessary.

Prerequisite(s): One of Computer Science 217, 231, 235 or Engineering 233.

Note: One of Mathematics 211, 213, 249, 251, 265, 271, 273, 275, 281 or Applied Mathematics 217 is recommended as preparation for this course.

Computer Science 331 **3 units; H(3-2T)**

Data Structures, Algorithms, and Their Analysis
Fundamental data structures, including arrays, lists, stacks, queues, trees, hash tables, and graphs. Algorithms for searching and sorting. Introduction to the correctness and analysis of algorithms. For computer science majors and those interested in algorithm design and analysis, information security, and other mathematically-intensive areas.

Prerequisite(s): Mathematics 271 or 273; and one of Computer Science 219, 233, 235 or Computer Engineering 339.

Antirequisite(s): Credit for Computer Science 331 and 319 will not be allowed.

Computer Science 335 **3 units; H(3-2T)**

Intermediate Information Structures
A continuation of Computer Science 319 or 331. Collision resolution in hash tables, search algorithms, advanced tree structures, strings. Advanced algorithmic tools for the storing and manipulation of information.

Prerequisite(s): Computer Science 319 or 331.

Computer Science 355 **3 units; H(3-2T)**

Computing Machinery I
An introduction to computing machinery establishing the connection between programs expressed in a compiled language, an assembly language, and machine code, and how such code is executed. Includes the detailed study of a modern CPU architecture, its assembly language and internal data representation, and the relationship between high-level program constructs and machine operations.

Prerequisite(s): One of Computer Science 219, 233 or 235.

Antirequisite(s): Credit for Computer Science 355 and 265 or Computer Engineering 369 will not be allowed.

Computer Science 359 **3 units; H(3-2T)**

Computing Machinery II
An introduction to hardware and microprocessor design, including the connection between gate-level digital logic circuits and sequential machines that can execute an algorithm and perform input and output.

Prerequisite(s): Computer Science 355 and Philosophy 279 or 377.

Antirequisite(s): Credit for Computer Science 359 and any of 325, 455 or Computer Engineering 415 will not be allowed.

Note: A supplementary fee will be assessed to cover additional costs associated with this course.

Computer Science 399 **3 units; H(3-0)**

Special Topics in Computer Science
Exploration of various areas in Computer Science. Topics will vary from year-to-year. It will be offered as required to provide the opportunity for students to engage in additional areas in Computer Science. Before registration, consult the Department of Computer Science for topics offered.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Computer Science 409 **3 units; H(3-0)**

History of Computation
The history of computation from the earliest times to the modern era.

Prerequisite(s): Computer Science 355.

Computer Science 411 **3 units; H(3-2T)**

Compiler Construction
Introduction to compilers, interpreters, and the tools for parsing and translation. Lexical analysis, context free grammars and software tools for their recognition. Attribute grammars and their applications in translation and compiling.

Prerequisite(s): Computer Science 319 or 331.

Note: Computer Science 313 is strongly recommended as preparation for this course.

Computer Science 413 **3 units; H(3-2T)**

Design and Analysis of Algorithms I
Techniques for the analysis of algorithms, including counting, summation, recurrences, and asymptotic relations; techniques for the design of efficient algorithms, including greedy methods, divide and conquer, and dynamic programming; examples of their application; an introduction to tractable and intractable problems.

Prerequisite(s): Computer Science 313; and either Computer Science 331 or both Computer Science 319 and 105; and Mathematics 211 or 213; and one of Mathematics 249, 251, 265, 275, 281 or Applied Mathematics 217.

Note: One of Mathematics 265 or 275 is highly recommended as preparation for this course, but not mandatory. Students who have completed Computer Science 319 instead of Computer Science 331, and who have been unable to complete Computer Science 105, should contact the Department of Computer Science for information about how to be prepared for, and how to be eligible to take, Computer Science 413.

Computer Science 418 **3 units; H(3-2T)**

Introduction to Cryptography
The basics of cryptography, with emphasis on attaining well-defined and practical notations of security. Symmetric and public key cryptosystems; one-way and trapdoor functions; mechanisms for data integrity; digital signatures; key management; applications to the design of cryptographic systems. In addition to written homework, assessment will involve application programming; additional mathematical theory and proof-oriented exercises will be available for extra credit.

Prerequisite(s): Either Computer Science 331 or both Computer Science 319 and 105; and one of Mathematics 271, 273 or Pure Mathematics 315.

Antirequisite(s): Credit for Computer Science 418 and any of Computer Science 429, 557, Pure Mathematics 329 or 418 will not be allowed.

Note: Students who have completed Computer Science 319 instead of Computer Science 331, and who have been unable to complete Computer Science 105, should contact the Department of Computer Science for information about how to be prepared for, and eligible to take, Computer Science 418.

Computer Science 433 **3 units; H(3-2T)**

Artificial Intelligence
An examination of the objectives, key techniques and achievements of work on artificial intelligence in Computer Science.

Prerequisite(s): Computer Science 313 and Philosophy 279.

Note: Prior or concurrent completion of Computer Science 349 or 449 is strongly recommended as preparation for this course.

Computer Science 441 **3 units; H(3-2T)**

Computer Networks
Principles and practice in modern telecommunications, computer communications and networks. Layered communication protocols and current physical, data link, network and Internet protocol

layers. Circuit switching, packet switching, and an introduction to broadband multimedia networking.

Prerequisite(s): Computer Science 319 or 331; and one of Computer Science 325, 359 or Computer Engineering 369.

Antirequisite(s): Credit for Computer Science 441 and Electrical Engineering 573 will not be allowed.

Computer Science 449 3 units; H(3-2T)
(formerly Computer Science 349)

Programming Paradigms
Examination of the basic principles of the major programming language paradigms. Focus on declarative paradigms such as functional and logic programming. Data types, control expressions, loops, types of references, lazy evaluation, different interpretation principles, information hiding.

Prerequisite(s): Computer Science 319 or 331; and Philosophy 279 or 377.

Note: The prerequisite of Philosophy 279 or 377 is waived for Engineering students in the Software Engineering program.

Computer Science 453 3 units; H(3-2T)

Introduction to Computer Graphics
Introduction to computer graphics. Principles of raster image generation. Example of a graphics API. Graphics primitives. Co-ordinate systems, affine transformations and viewing of graphical objects. Introduction to rendering including shading models and ray tracing. Introduction to modelling including polygon meshes, subdivision, and parametric curves and surfaces.

Prerequisite(s): Computer Science 319 or 331; and Mathematics 211 or 213; and one of Mathematics 253, 267, 277, 283 or Applied Mathematics 219.

Computer Science 457 3 units; H(3-2T)

Principles of Operating Systems
An introduction to operating systems principles. Performance measurement; concurrent programs; the management of information, memory and processor resources.

Prerequisite(s): Computer Science 319 or 331; and one of Computer Science 325, 359 or Computer Engineering 369.

Note: Prior or concurrent completion of Computer Engineering 511 is strongly recommended for students in Computer Engineering or Software Engineering programs.

Computer Science 461 3 units; H(3-2T)

Information Structures III
File architecture and manipulation techniques for various file types. Physical characteristics of current mass storage devices. Advanced data structures and algorithms for implementing various sequential and hierarchical file structures. File organization and design for various applications, file systems and other storage management techniques including website design.

Prerequisite(s): Computer Science 355 and one of 319 or 331.

Computer Science 471 3 units; H(3-2T)

Data Base Management Systems
Conceptual, internal and external data bases. Relational data base systems and SQL. The normal forms, data base design, and the entity-relationship approach.

Prerequisite(s): Computer Science 319 or 331.

Antirequisite(s): Credit for Computer Science 471 and Business Technology Management 331 will not be allowed.

Computer Science 481 3 units; H(3-2T)

Human-Computer Interaction I
Fundamental theory and practice of the design, implementation, and evaluation of human-computer interfaces. Topics include: principles of design; methods for evaluating interfaces with or without user involvement; techniques for prototyping and implementing graphical user interfaces.

Prerequisite(s): Software Engineering 301.

Computer Science 491 3 units; H(3-2T)

Techniques for Numerical Computation
Elementary techniques for the numerical solution of mathematical problems on a computer, including methods for solving linear and non-linear equations, numerical integration, and interpolation.

Prerequisite(s): Computer Science 319 or 331; and Mathematics 211 or 213; and one of Mathematics 249, 251, 265, 275, 281 or Applied Mathematics 217.

Antirequisite(s): Credit for Computer Science 491 and either Applied Mathematics 491 or 493 will not be allowed.

Computer Science 499 3 units; H(3-0)

Special Topics in Computer Science
Exploration of various areas in Computer Science. Topics will vary from year to year. It will be offered as required to provide the opportunity for students to engage in additional areas in Computer Science. Before registration, consult the Department of Computer Science for topics offered.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Computer Science 501 3 units; H(3-2T)

Advanced Programming Techniques
Theory and application of advanced programming methods and tools. Recent issues as well as those of an enduring nature will be discussed.

Prerequisite(s): Computer Science 349 or 449.

Computer Science 502 6 units; F(1-5)

Research Project
A substantial research project under the guidance of a faculty member. A report must be written and presented on completion of the course.

502.01. Research Project in Computer Science

502.02. Research Project in Theoretical Computer Science

502.03. Research Project in Computer Graphics

502.04. Research Project in Information Security

502.05. Research Project in Scientific Computation

502.06. Research Project in Software Engineering

502.07. Research Project in Human Computer Interaction

502.08. Research Project in Networks and Distributed Computing

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Computer Science 502 and any of 503, Software Engineering for Engineers 599 or 591 will not be allowed.

Note: Students intending to complete a research project in a specific area of computer science should register in the version of Computer Science 502 corresponding to that area, if such a course is available. Other students should register in Computer Science 502.01. Permission to register in Computer Science 502 is generally given only to students with a minimum GPA of 3.30 over the last 90 units (15 full-course equivalents). When demand exceeds capacity, registration in Computer Science 502 is limited to students in Honours programs in Computer Science.

Computer Science 503 3 units; H(1-5)

Project
A research project conducted under the guidance of a faculty member. A report must be presented on completion of the course.

503.01. Project in Computer Science

503.02. Project in Theoretical Computer Science

503.03. Project in Computer Graphics

503.04. Project in Information Security

503.05. Project in Scientific Computation

503.06. Project in Software Engineering

503.07. Project in Human Computer Interaction

503.08. Project in Networks and Distributed Computing

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Computer Science 503 and either 502 or Software Engineering for Engineers 599 will not be allowed.

Note: Students intending to complete a project in a specific area of computer science should register in the version of Computer Science 503 corresponding to that area, if such a course is available. Other students should register in Computer Science 503.01.

Computer Science 511 3 units; H(3-1T)

Introduction to Complexity Theory
Time and space complexity; the classes P, LOGSPACE, PSPACE and their nondeterministic counterparts; containments and separations between complexity classes; intractability and the theory of NP-completeness; complexity theories for probabilistic algorithms and for parallel algorithms.

Prerequisite(s): Computer Science 413.

Computer Science 513 3 units; H(3-1T)

Computability
Computable functions; decidable and undecidable problems; Church's thesis and recursive functions.

Prerequisite(s): Computer Science 313.

Note: Computer Science 413 is strongly recommended as preparation for this course.

Computer Science 517 3 units; H(3-2T)

Design and Analysis of Algorithms II
Advanced techniques for the design and analysis of deterministic and probabilistic algorithms; techniques for deriving lower bounds on the complexity of problems.

Prerequisite(s): Computer Science 413.

Computer Science 518 3 units; H(3-2T)

Introduction to Computer Algebra
Fundamental problems, classical and modern algorithms, and algorithm design and analysis techniques of use in computer algebra. Integer and polynomial arithmetic. Additional problems in computer algebra, possibly including problems in computational linear algebra, factorization, and concerning systems of polynomial equations will be considered as time permits.

Prerequisite(s): Computer Science 413 and one of Mathematics 211 or 213.

Note: Computer Science 491 and Pure Mathematics 315 are recommended as preparation for this course.

Computer Science 519 3 units; H(3-1T)

Introduction to Quantum Computation
Quantum information, quantum algorithms including Shor's quantum factoring algorithm and Grover's quantum searching technique, quantum error correcting codes, quantum cryptography, nonlocality and quantum communication complexity, and quantum computational complexity.

Prerequisite(s): Computer Science 413 and one of Mathematics 311 or 313.

Computer Science 521 3 units; H(3-2T)

Foundations of Functional Programming
Theoretical foundations of functional programming: the lambda-calculus, beta-reduction, confluence, and reduction strategies. Programming syntax: solving recursive equations with the Y-combinator, let and letrec, types, datatypes, and patterns. Programming in a functional language: recursion patterns, useful combinators, maps, and folds, for datatypes. Example applications: recursive descent parsing, unification, combinatorial algorithms, theorem proving.

Prerequisite(s): Computer Science 313 and one of Computer Science 349 or 449.

Computer Science 522 3 units; H(3-2T)

Introduction to Randomized Algorithms
Techniques for the design and analysis of randomized algorithms; discrete probability theory; randomized data structures; lower bound techniques; randomized complexity classes; advanced algorithmic applications from various areas.

Prerequisite(s): Computer Science 413.

Note: Mathematics 321 or Statistics 321 is recommended as preparation for this course.

Computer Science 525 3 units; H(3-2T)

Principles of Computer Security
Security policies and protection mechanisms for a computing system, including such topics as design principles of protection systems, authentication and authorization, reference monitors, security architecture of popular platforms, formal modelling of protection systems, discretionary access control, safety analysis, information flow control, integrity, role-based access control. Legal and ethical considerations will be introduced.

Prerequisite(s): Computer Science 457 and one of Mathematics 271 or 273.

Antirequisite(s): Credit for Computer Science 525 and 529 will not be allowed.

Note: Computer Science 329 is recommended as preparation for this course.

Computer Science 526 3 units; H(3-2T)

Network Systems Security
Attacks on networked systems, tools and techniques for detection and protection against attacks including firewalls and intrusion detection and protection systems, authentication and identification in distributed systems, cryptographic protocols for IP networks, security protocols for emerging networks and technologies, privacy enhancing communication. Legal and ethical issues will be introduced.

Prerequisite(s): Computer Science 441.

Antirequisite(s): Credit for Computer Science 526 and 529 will not be allowed.

Note: Computer Science 329 and one of Pure Mathematics 329, Computer Science 418 or Pure Mathematics 418 are recommended as preparation for this course.

Computer Science 527 3 units; H(3-0)

Computer Viruses and Malware
Study of computer viruses, worms, Trojan horses, and other forms of malicious software. Countermeasures to malicious software. Legal and ethical issues, and some general computer and network security issues.

Prerequisite(s): Computer Science 313 and 457 and consent of the Department.

Computer Science 528 3 units; H(3-0)

Spam and Spyware
Spam and other unsolicited bulk electronic communication, and spyware. Legal and ethical issues. Countermeasures and related security problems.

Prerequisite(s): Computer Science 313 and 457 and consent of the Department.

Computer Science 530 3 units; H(3-2T)

Information Theory and Security
Information theoretic concepts such as entropy and mutual information and their applications to defining and evaluating information security systems including encryption, authentication, secret sharing and secure message transmission.

Prerequisite(s): One of Computer Science 219, 233 or 235, one of Mathematics 271, 273 or Pure Mathematics 315, and one of Statistics 205 or 211 or 213 or 321 or Mathematics 321.

Note: Computer Science 329 is recommended as preparation for this course.

Computer Science 531 3 units; H(3-2T)

Systems Modelling and Simulation
An introduction to the modelling and simulation of stochastic systems; programming language issues; model and tool design; input data modelling; simulation experiments; and the interpretation of simulation results.

Prerequisite(s): Computer Science 457 and one of Mathematics 321 or Statistics 205 or 211 or 213 or 321.

Note: Mathematics 321 is recommended over Statistics 205 or 211 or 213 as preparation for this course. Computer Science 441 is also recommended as preparation for this course.

Computer Science 535 3 units; H(3-2T)

Introduction to Image Analysis and Computer Vision
Standard methods used in the analysis of digital images. Image acquisition and display: visual perception; digital representation. Sampling and enhancement. Feature extraction and classification methods. Object recognition.

Prerequisite(s): One of Mathematics 311, 313, 331, 353, Applied Mathematics 307, 311, Pure Mathematics 331.

Computer Science 550 6 units; F(2-3)

Systems Administration
Topics and practices in systems administration and management. Required and optional administration duties and responsibilities. Moral and ethical conundrums, and legal responsibilities, in systems operation. Configuration and installation of operating systems and network and systems services.

Prerequisite(s): Computer Science 457 and consent of the Department.

Computer Science 559 3 units; H(3-2T)

Introduction to Distributed Systems
Designing and implementing distributed systems that overcome challenges due to concurrent computation, failure of components in the system and heterogeneity of processors and communication channels.

Prerequisite(s): Computer Science 457.

Computer Science 561 3 units; H(3-2T)

Introduction to Distributed Algorithms
Basic problems in distributed systems such as symmetry breaking, consensus, resource allocation, and synchronization. The impact of system characteristics, such as models of communication, timing and failure, and of solution requirements, such as correctness and complexity criteria and algorithmic constraints, on the computability and complexity of these problems. Techniques for solving problems under different models will be emphasized.

Prerequisite(s): Computer Science 413.

Computer Science 565 3 units; H(3-1T)

Emergent Computing
An insight into a new mindset for programming as an emergent and evolutionary process of "breeding," rather than constructing. Programs can evolve to perform specific tasks in a bottom-up fashion rather than being manually coded. Topics will include: decentralized agent-based programming, massive parallelism and interaction, evolution, swarm intelligence.

Prerequisite(s): Computer Science 433.

Note: Offered in even-odd dated academic years.

Computer Science 567 3 units; H(3-1T)

Foundations of Multi-Agent Systems
Modelling of agents and properties of multi-agent systems. Communication issues, including interaction and co-ordination concepts, forming and maintaining organizations, and competitive agent environments. Example systems; the implementation of a multi-agent system will be performed as the assignment.

Prerequisite(s): Computer Science 457 and 433.

Note: Offered in odd-even dated academic years.

Computer Science 568 3 units; H(3-0)

Agent Communications
An examination of communication paradigms in multi-agent systems. A number of paradigms will be covered including simple protocols, BDI (Believe, Desire, Intension), and social commitments.

Prerequisite(s): Computer Science 433 and consent of the Department.

Computer Science 571 3 units; H(3-2T)

Design and Implementation of Database Systems
Implementation and design of modern database systems including query modification/optimization, recovery, concurrency, integrity, and distribution.

Prerequisite(s): Computer Science 461 and 471.

Computer Science 572 3 units; H(3-2T)
(formerly Computer Science 599.77)

Fundamentals of Social Network Analysis and Data Mining
Introduction to data mining with emphasis on frequent pattern mining, clustering and classification, data collection, network construction, basic graph theory concepts and network analysis metrics, and case studies.

Prerequisite(s): Computer Science 571.

Computer Science 581 **3 units; H(3-2)**

Human-Computer Interaction II
Intermediate and advanced topics and applications in human-computer interaction, to further one's skills for designing highly interactive human-computer interfaces.

Prerequisite(s): Computer Science 481 and consent of the Department.

Computer Science 583 **3 units; H(3-2T)**

Introduction to Information Visualization
Principles of information representation, presentation and interaction. Development of mappings from data to visual structures and exploration, navigation, cues, distortion and emphasis techniques.

Prerequisite(s): Computer Science 319 or 331.

Note: Prior or concurrent completion of Computer Science 453 or 481 is strongly recommended.

Computer Science 584 **3 units; H(3-2T)**

Human-Robot Interaction
Introduction to the design, implementation and evaluation of human-robot interfaces. Topics include the evaluation of human-robot interaction (HRI), theoretical, philosophical and ethical issues, exploration of applications and tasks, prototyping HRI tools, and practical implementation and evaluation methods.

Prerequisite(s): Computer Science 481 and consent of the Department.

Computer Science 585 **3 units; H(3-2)**

Games Programming
Standard techniques for the implementation of computer games. Standard multimedia programming environments and high performance multimedia. Special purpose rendering engines. Interactive control and feedback; modelling.

Prerequisite(s): Computer Science 453 and consent of the Department.

Computer Science 587 **3 units; H(3-2T)**

Fundamentals of Computer Animation
Principles of traditional animation, key framing, parametric and track animation, free form deformation, inverse kinematics, dynamics, spring mass systems, particle systems, numerical integration, Lagrangian constraints, space time constraints, collisions, human animation, behavioural animation, metamorphosis, implicit animation techniques, animating liquids, gases and cloth, motion capture.

Prerequisite(s): Computer Science 453.

Computer Science 589 **3 units; H(3-2T)**

Modelling for Computer Graphics
Parametric Modelling. B-splines and NURBS. Subdivision schemes. Surface subdivision. Multiresolution. Wavelets. Implicit modelling. Blends. Polygonization. Blobtree. Precise contact modelling. Solid modelling. CSG. Procedural modelling. Special topics, e.g. Differential geometry. Graph-based modelling. Topology.

Prerequisite(s): Computer Science 453.

Computer Science 591 **3 units; H(3-2T)**

Rendering
Physical foundations of illuminations techniques. Colour. Radiometry and photometry. Reflection models. The rendering equation. Ray tracing. Monte Carlo techniques. Sampling and antialiasing. Texturing. Radiosity. Photon tracing. Volume rendering. Image-based rendering. Real-time shading.

Prerequisite(s): Computer Science 453.

Computer Science 594 **6 units; F(1-5)**

Software Engineering Project
A software engineering project conducted under the guidance of a faculty member.

Prerequisite(s): Consent of the Department.

Note: Includes a research, writing and presentation component.

Computer Science 598 **6 units; F(3-0)**

Special Topics in Computer Science
New areas in Computer Science. It will be offered only as required. Before registration consult the Department of Computer Science for topics offered.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Computer Science 599 **3 units; H(3-0) or H(3-2)**

Special Topics in Computer Science
Exploration of various areas in Computer Science. Topics will vary from year to year. It will be offered as required to provide the opportunity for students to engage in additional areas in Computer Science. Before registration, consult the Department of Computer Science for topics offered.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Note: Registration in all courses requires the approval of the Department of Computer Science. Computer Science students should also see courses listed under Software Engineering.

Computer Science 601 **3 units; H(3-0)**

Special Topics in Computer Science
A study of problems of particular interest to graduate students in Computer Science.

MAY BE REPEATED FOR CREDIT

Computer Science 605 (Medical Science 605) **3 units; H(3-0)**

Information Storage and Processing in Biological Systems
Examination of complex biological systems; concepts and fundamentals of biological solutions to information storage and processing; modelling and computer simulation of biological systems; information storage in biological molecules; genetic networks; hierarchical organization of biological information processing in signal transduction, development, evolution, and ecology; biological control systems.

Computer Science 607 **3 units; H(3-0)**

Biological Computation
Examination and modelling of biological networks; focus on the latest developments in biological computing and their theoretical backgrounds, such as: DNA computing; genomic algorithms; artificial chemistries; complex adaptive systems, chaos and fractals; immune system computing; gene regulatory networks; swarm intelligence systems.

Computer Science 609 **3 units; H(3-0)**

Foundations of Multi-Agent Systems
Modelling of agents and properties of multi-agent systems. Communication issues, including interaction and co-ordination concepts, forming and maintaining organizations, and competitive agent environments. Example systems; the implementation of a multi-agent system will be performed as the assignment.

Antirequisite(s): Credit for Computer Science 609 and Software Engineering 697 will not be allowed for programs offered by the Department of Computer Science.

Computer Science 610 **3 units; H(3-0)**

Compiler Code Generation and Optimization
Compiler code generation and optimization techniques, including register allocation, instruction selection, dataflow analysis, and code optimization techniques using intermediate representations. Implementation of special language features and tools for automated code generation.

Computer Science 611 **3 units; H(3-0)**

Complexity Theory
Deterministic and non-deterministic time and space complexity; complexity classes and hierarchies; NP-complete problems and intractable problems; axiomatic complexity theory.

Note: Computer Science 413 or equivalent is recommended as preparation for this course.

Computer Science 615 **3 units; H(3-0)**

Computational Techniques for Graphics and Visualization
Various case studies from the fields of graphics and visualization.

Note: Computer Science 453 or equivalent is recommended as preparation for this course.

Computer Science 617 **3 units; H(3-0)**

Category Theory for Computer Science
Introduction to category theory with applications in computer science. Functors, natural transformations, adjoints and monads, initial and final algebras. Introduction to 2-categories and fibrations.

Note: Computer Science 513 or 521 or equivalent is recommended as preparation for this course.

Computer Science 619 **3 units; H(3-0)**

Quantum Computation
Quantum information, quantum algorithms including Shor's quantum factoring algorithm and Grover's quantum searching technique, quantum error correcting codes, quantum cryptography, nonlocality and quantum communication complexity, and quantum computational complexity.

Computer Science 622 **3 units; H(3-0)**

Randomized Algorithms
Design and analysis of randomized algorithms; discrete probability theory; randomized data structures; lower bound techniques; randomized complexity classes; advanced algorithmic applications from various areas.

Computer Science 625 **3 units; H(3-0)**

Principles of Computer Security
Security policies and protection mechanisms for a computing system, including such topics as design principles of protection systems, authentication and authorization, reference monitors, security architecture of popular platforms, formal modelling of protection systems, discretionary access control, safety analysis, information flow control, integrity, role-based access control. Legal and ethical considerations will be introduced as necessary.

Note: Computer Science 457 and Mathematics 271, or equivalents, are recommended as preparation for this course.

Computer Science 626 **3 units; H(3-0)**

Network Systems Security
Attacks on networked systems, tools and techniques for detection and protection against attacks including firewalls and intrusion detection and protection systems, authentication and identification in distributed systems, cryptographic protocols for IP networks, security protocols for emerging networks and technologies, privacy enhancing communication. Legal and ethical issues will be introduced as necessary.

Note: Computer Science 418 and 441, or equivalents, are recommended as preparation for this course.

Computer Science 627 **3 units; H(3-0)**

Computer Viruses and Malware
Study of computer viruses, worms, Trojan horses, and other forms of malicious software. Countermeasures to malicious software. Legal and ethical issues, and some general computer and network security issues.

Prerequisite(s): Computer Science 313 and 457 or equivalents and consent of the Department.

Computer Science 628 **3 units; H(3-0)**

Spam and Spyware
Spam and other unsolicited bulk electronic communication, and spyware. Legal and ethical issues. Countermeasures, and related security problems.

Prerequisite(s): Computer Science 313 and 457 or equivalents and consent of the Department.

Computer Science 629 **3 units; H(3-0)**
(Pure Mathematics 629)

Elliptic Curves and Cryptography
An introduction to elliptic curves over the rationals and finite fields. The focus is on both theoretical and computational aspects; subjects covered will include the study of endomorphism rings, Weil pairing, torsion points, group structure, and effective implementation of point addition. Applications to cryptography will be discussed, including elliptic curve-based Diffie-Helman key exchange, El Gamal encryption, and digital signatures, as well as the associated computational problems on which their security is based.

Note: Pure Mathematics 315 is recommended as preparation for this course.

Computer Science 630 **3 units; H(3-2T)**

Information Theory and Security
Information theoretic concepts such as entropy and mutual information, and their applications to defining and evaluating information security systems including encryption, authentication, secret sharing and secure message transmission.

Note: One of Computer Science 219, 233 or 235 and one of Mathematics 271, 273 or Pure Mathematics 315 and one of Statistics 205 or 211 or 213 or 321 or Mathematics 321, or equivalents, are recommended as preparation for this course.

Computer Science 635 **3 units; H(3-2T)**

Image Analysis and Computer Vision
Standard methods used in the analysis of digital images. Image acquisition and display: visual perception; digital representation. Sampling and enhancement. Feature extraction and classification methods. Object recognition.

Computer Science 641 **3 units; H(3-0)**

Performance Issues in High Speed Networks
An overview of current research in high speed networks. Topics covered will include the current Internet, the future Internet, wireless networks, optical networks, Asynchronous Transfer Mode (ATM), TCP/IP, network traffic measurement, Web server performance, and mobile computing. Emphasis will be placed on network performance issues for next-generation Internet protocols and applications.

Computer Science 643 **3 units; H(3-0)**

Modern Wireless Networks
An introduction to the fundamentals and applications of wireless networks.

Computer Science 653 **3 units; H(3-0)**

Computational Geometry
Geometric searching, hull proximity and intersection data structures and algorithms and their complexity.

Note: Computer Science 517 or equivalent is recommended as preparation for this course.

Computer Science 657 **3 units; H(3-0)**

Modelling And Visualization of Plants
Modelling, simulation and visualization of plants for computer graphics and biological purposes. Modelling of plants as an example of interdisciplinary research including computer science, biology, mathematics and physics. L-systems as a formal basis for model construction. Modelling languages. Information flow in plants. Symmetry, self-similarity and allometry of plants. Descriptive models of plant architecture. Models integrating plant structure and function. Simulation of plant development. Case studies: competition for space, phyllotaxis, tropisms, and biomechanical considerations. Reaction-diffusion models of morphogenesis. Genotype-to-phenotype mapping. Modelling of plant ecosystems. Rendering and visualization of the models. A survey of applications and research directions.

Note: Computer Science 453 or equivalent is recommended as preparation for computer science students taking this course.

Computer Science 661 **3 units; H(3-0)**

Algorithms for Distributed Computation
Fundamental algorithmic problems in distributed computation; impact of communication, timing, failures and other characteristics on computability and complexity of solutions.

Prerequisite(s): Computer Science 561 or equivalent.

Computer Science 662 **3 units; H(3-0)**

Agent Communications
An examination of communication paradigms in multi-agent systems. A number of paradigms will be covered including simple protocols, BDI (Believe, Desire, Intension), and social commitments.

Computer Science 667 **3 units; H(3-0)**

Computer Algebra
Fundamental problems, classical and modern algorithms, and algorithm design and analysis techniques of use in computer algebra. Integer and polynomial arithmetic. Additional problems in computer algebra, possibly including problems in computational linear algebra, factorization, and concerning systems of polynomial equations will be considered as time permits.

Note: Computer Science 413, 491 and Pure Mathematics 315, or equivalents, are recommended as preparation for this course.

Computer Science 669 **3 units; H(3-0)**
(Pure Mathematics 669)

Cryptography
An overview of the basic techniques in modern cryptography, with emphasis on fit-for-application primitives and protocols. Topics will include symmetric and public-key cryptosystems; digital signatures; elliptic curve cryptography; key management; attack models and well-defined notions of security.

Note: Students should not have taken any previous course in cryptography.

Computer Science 671 **3 units; H(3-0)**

Database Management Systems
Foundations of database applications and database systems, plus some advanced topics in data management systems will be introduced.

Computer Science 672 **3 units; H(3-0)**
(formerly Computer Science 601.77)

Fundamentals of Social Network Analysis and Data Mining
Introduction to data mining with emphasis on frequent pattern mining, clustering and classification, data collection, network construction, basic graph theory concepts and network analysis metrics, and case studies.

Antirequisite(s): Students may not have credit for more than one of Computer Science 672, 572 or 599.77.

Computer Science 673 **3 units; H(3-0)**

Distributed Database Systems
Introduction to distributed database systems. Topics covered include: architecture, data design, query processing, transaction management, multidatabases, object-oriented databases and advanced system issues.

Computer Science 675 **3 units; H(3-0)**

Datawarehouse Systems
Design, development and deployment of datawarehouses. Schemas, models, data organization, OLAP, tuning, data mining and architectural models may be discussed.

Computer Science 681 **3 units; H(3-0)**

Research Methods in Human-Computer Interaction
Application of the theory and methodology of human-machine studies to real systems; theory and practice.

Note: Computer Science 481 or equivalent is recommended as preparation for this course.

Computer Science 683 **3 units; H(3-0)**

Information Visualization: Theory and Practice
The theory and development of interactive visual representations of abstract data for the purpose of amplifying cognition. Topics covered can include representational issues, perceptual issues, visual literacy, spatial abstraction, and interaction issues.

Note: Computer Science 583 or equivalent is recommended as preparation for this course.

Computer Science 687 **3 units; H(3-2T)**

Computer Animation
Principles of traditional animation, key framing, parametric and track animation, free form deformation, inverse kinematics, dynamics, spring mass systems, particle systems, numerical integration, Lagrangian constraints, space time constraints, collisions, human animation, behavioural animation, metamorphosis, implicit animation tech-

niques, animating liquids, gases and cloth, motion capture.

Computer Science 689 **3 units; H(3-2T)**

Modelling for Computer Graphics
Parametric Modelling. B-splines and NURBS. Subdivision schemes. Surface subdivision. Multiresolution. Wavelets. Implicit modelling. Blends. Polygonization. Blobtree. Precise contact modelling. Solid modelling. CSG. Procedural modelling. Special topics, e.g. Differential geometry. Graph-based modelling. Topology.

Computer Science 691 **3 units; H(3-0)**

Rendering
Physical foundations of illuminations techniques. Colour. Radiometry and photometry. Reflection models. The rendering equation. Ray tracing. Monte Carlo techniques. Sampling and antialiasing. Texturing. Radiosity. Photon tracing. Volume rendering. Image-based rendering. Real-time shading.

Computer Science 695 **3 units; H(3-0)**

Data Management in Geographical Information Systems
Examination of advanced geometric algorithms for representation, analysis and visualization of Geographical Information Systems. Data structures such as progressive mesh, ROAM, multidimensional Delauney triangulization, quadtree and space partitioning. Algorithmic techniques such as incremental, divide and conquer, sweep-plane, and dimension reduction. Algorithms for surface simplification, culling, quality measurement and reduction.

Computer Science 696 **3 units; H(3-0)**

Information Security Seminar
Topics in information security, such as security management, emerging threats, research frontiers using case studies and best practices.

Antirequisite(s): Credit for Computer Science 696 and 699 will not be allowed.

Note: This course is intended to help students identify a project topic for Computer Science 698 and meets for one and one-half hours per week during the Fall and Winter Terms.

Computer Science 697 **3 units; H(3-0)**

Biometric Security
Principles of biometric system design, technology and performance evaluation. Verification, identification and synthesis in biometrics. Traditional and emerging techniques for fingerprint matching, face recognition, iris modelling, signature authentication, and biometric pattern recognition. Multimodal biometrics and biometric security.

Computer Science 698 **6 units; F(3-0)**

Information Security Project
An information security project conducted under the guidance of a faculty member. A report must be written and presented on completion of the course.

Computer Science 699 **3 units; H(3-0)**

Research Methodology in Computer Science
An introduction to and survey of research areas and methods in Computer Science. Professional skills in computer science research such as reviewing, critical evaluation, and the preparation of research proposals.

Antirequisite(s): Credit for Computer Science 699 and 696 will not be allowed.

Note: This course meets for one and one-half hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Computer Science 701 **3 units; H(3-0)**

Research Topics in Computer Science
In-depth course on a focused current research topic in Computer Science. Involves a significant research component and requires substantial background knowledge.

MAY BE REPEATED FOR CREDIT

Computer Science 767 **3 units; H(3-0)**

Advanced Topics in Multiagent Systems
An in-depth study of a selected subfield of multiagent systems including state-of-the-art research. This is a project-driven course.

Prerequisite(s): Computer Science 567 or 609.

Computer Science 771 **3 units; H(3-0)**

Current Trends in Database Technology
Advanced topics chosen from Bioinformatics, Data mining, Mobile Databases, Spatial Databases and Web Databases. There is a large project component.

Computer Science 781 **3 units; H(3-0)**

Advanced Topics in Human-Computer Interaction
The topics covered will change year by year depending on current advances in human computer interaction.

Prerequisite(s): Computer Science 481 or equivalent.

Note: Computer Science 581 or 681 or equivalent is highly recommended as preparation for this course.

Computer Science 785 **3 units; H(3-0)**

Implicit Modelling
A detailed look at modelling using implicit and iso-surface techniques taking an in-depth review of the literature. Algebraic methods will be followed by skeletal models, field function design, modelling techniques, rendering and texture mapping. Polygonisation algorithms, ray tracing implicits, techniques for animation, meta-morphosis, precise contact modelling, deformation and warping. Algorithms and data structures and implementation details will be presented. Students will be expected to make a new contribution in their project and term paper.

Computer Science 789 **3 units; H(3-0)**

Advanced Geometric Modelling
Current research topics including spline modelling, Subdivision Surfaces, multiresolution, wavelets, analysis of the subdivision surfaces and reverse subdivision.

Co-operative Education COOP

Senior Courses

Co-operative Education 501
15 units; (4 months)

Co-operative Placement in Actuarial Science
501.01. Co-operative Placement in Actuarial Science I
501.02. Co-operative Placement in Actuarial Science II
501.03. Co-operative Placement in Actuarial Science III
501.04. Co-operative Placement in Actuarial Science IV
501.05. Co-operative Placement in Actuarial Science V

NOT INCLUDED IN GPA

Co-operative Education 503
15 units; (4 months)

Co-operative Placement in Applied Chemistry
503.01. Co-operative Placement in Applied Chemistry I
503.02. Co-operative Placement in Applied Chemistry II
503.03. Co-operative Placement in Applied Chemistry III
503.04. Co-operative Placement in Applied Chemistry IV
503.05. Co-operative Placement in Applied Chemistry V

NOT INCLUDED IN GPA

Co-operative Education 511
15 units; (4 months)

Co-operative Placement in Arts
511.01 Co-operative Placement in Arts I
511.02 Co-operative Placement in Arts II
511.03 Co-operative Placement in Arts III
511.04 Co-operative Placement in Arts IV

NOT INCLUDED IN GPA

Co-operative Education 523
15 units; (4 months)

Co-operative Placement in Business
523.01. Co-operative Placement in Business I
523.02. Co-operative Placement in Business II
523.03. Co-operative Placement in Business III
523.04. Co-operative Placement in Business IV

NOT INCLUDED IN GPA

Co-operative Education 543
15 units; (4 months)

Co-operative Placement in Ecology
543.01. Co-operative Placement in Ecology I
543.02. Co-operative Placement in Ecology II
543.03. Co-operative Placement in Ecology III
543.04. Co-operative Placement in Ecology IV
543.05. Co-operative Placement in Ecology V

NOT INCLUDED IN GPA

Dance DNCE

Instruction offered by members of Dance in the School of Creative and Performing Arts in the Faculty of Arts. An audition and consent of Dance is necessary before students register in certain courses.

Junior Courses

Dance 201 **3 units; H(2-2)**

Introductory Contemporary Dance I
Introductory study of the techniques of contemporary dance.

Note: Not open to Dance Majors.

NOT INCLUDED IN GPA

Dance 205 **3 units; H(2S-2)**

Introductory Contemporary Dance II
Further introductory study of the techniques of contemporary dance.

Prerequisite(s): Dance 201.

Note: Not open to Dance majors.

NOT INCLUDED IN GPA

Dance 207 **3 units; H(2S-2)**

Elementary Contemporary Dance I
Elementary study of the techniques of contemporary dance.

Prerequisite(s): Dance 205 and audition.

Dance 209 **3 units; H(2-2)**

Elementary Contemporary Dance II
Further elementary study of the techniques of contemporary dance.

Prerequisite(s): Dance 207 or equivalent. Audition required if Dance 207 was not completed in the previous term.

Dance 211 **3 units; H(2S-2)**

Introductory Jazz Dance
Introductory study of the techniques of jazz dance.

NOT INCLUDED IN GPA

Dance 213 **3 units; H(2S-2)**

Introductory Jazz Dance II
Further introductory study of the techniques of jazz dance.

Prerequisite(s): Dance 211.

Note: Dance 213 and 223 will be offered in alternating years.

NOT INCLUDED IN GPA

Dance 221 **3 units; H(2S-2)**

Introductory Ballet I
Introductory study of the techniques of ballet.

NOT INCLUDED IN GPA

Dance 223 **3 units; H(2S-2)**

Introductory Ballet II
Further introductory study of the techniques of ballet.

Prerequisite(s): Dance 221.

Note: Dance 213 and 223 will be offered in alternating years.

NOT INCLUDED IN GPA

Dance 235 **3 units; H(2S-2)**

Principles of Conditioning for Dancers
Theory and practice of conditioning for dancers.

Prerequisite(s): Dance 207 and admission to the Dance program.

Dance 243 **3 units; H(1-3)**

Dance in Popular Culture
Survey of social dance forms from World War I to present.

Dance 247 **3 units; H(2-2)**

Introduction to Creative Process: Vocabulary and Analysis
Fundamental vocabulary of dance creation and choreographic analysis.

Prerequisite(s): Admission to the Dance major.

Dance 267 **3 units; H(3S-0)**

Writing Dance
The study and practice of written communication in dance.

Dance 295 **3 units; H(1-3)**

Dance Performance Practicum I
Practical experience in dance performance.

Prerequisite(s): Consent of the Division Chair, Dance.

NOT INCLUDED IN GPA

Senior Courses

Dance 303 **3 units; H(2S-4)**

Principles of Technique
Reinforcement of the basic principles of contemporary dance in preparation for more advanced study.

Prerequisite(s): Dance 209 and audition.

Dance 305 **3 units; H(2S-4)**

Elementary Contemporary Dance III
This completes the elementary sequence in the techniques of contemporary dance.

Prerequisite(s): Dance 209 and audition.

Dance 307 **3 units; H(2S-4)**

Intermediate Contemporary Dance I
Intermediate study of the techniques of contemporary dance.

Prerequisite(s): Dance 305. Audition required if Dance 305 was not completed in the previous term.

Dance 309 **3 units; H(3S-0)**

Special Topics in Dance Theory I
Prerequisite(s): Consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance 311 **3 units; H(2S-4)**

Elementary Jazz Dance I
Elementary study of the techniques of jazz dance.

Prerequisite(s): Dance 211 and audition.

Dance 313 **3 units; H(2S-4)**

Elementary Jazz Dance II
Further elementary study of the techniques of jazz dance.

Prerequisite(s): Dance 311. Audition required if Dance 311 was not completed in the previous term.

Dance 315 **3 units; H(3-1)**

Hip Hop I
Introductory study of the techniques of hip hop.

Antirequisite(s): Credit for Dance 315 and 343.01 will not be allowed.

Dance 317 **3 units; H(3-1)**

Hip Hop II
Intermediate study of the techniques of hip hop.

Prerequisite(s): Dance 315.

Antirequisite(s): Credit for Dance 317 and 343.05 will not be allowed.

Dance 321 **3 units; H(2S-4)**

Elementary Ballet I
Elementary study of the techniques of ballet.

Prerequisite(s): Dance 221 and audition.

Dance 323 **3 units; H(2S-4)**

Elementary Ballet II
Further elementary study of the techniques of ballet.

Prerequisite(s): Dance 321. Audition required if Dance 321 was not completed in the previous term.

Dance 331 **3 units; H(2S-2)**

Creative Process I: Improvisation
A practical study of movement improvisation as a critical component of creative process with emphasis on improvisation as a performance practice and as a tool for creation.

Prerequisite(s): Dance 209 and 247.

Dance 333 **3 units; H(2S-2)**

Creative Process II: Solo Forms
A practical application of contemporary models of dance-making with a focus on articulating individualized movement language in the solo form.

Prerequisite(s): Dance 209 and 247.

Dance 341 **3 units; H(3S-0)**

Early Dance History
Historical survey of dance: origins through the nineteenth century.

Antirequisite(s): Credit for Dance 341 and 241 will not be allowed.

Dance 343 **3 units; H(2-2)**

Special Topics in Dance Practices I
Possible topics include Hip Hop, Contact Improvisation, African Dance, Mixed Ability Dance, Site Specific Dance.

Prerequisite(s): One junior level dance course and consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance 345 **3 units; H(3S-0)**

20th Century Dance History
Historical survey of western theatre dance.

Dance 363 **3 units; H(2S-2)**
(formerly Dance 463)

Dance Science and Kinesiology
Kinesiological analysis of dance, and the fundamentals of Dance Science.

Prerequisite(s): Kinesiology 259 or Dance 259 and two of Dance 205, 207, 209, 211, 221.

Dance 365 **3 units; H(2S-2)**

Pilates Conditioning
Study of the Pilates method of conditioning utilizing the Pilates Reformer apparatus.

Prerequisite(s): Dance 235.

Dance 375 **3 units; H(2-2)**

Complementary Dance Training Practices I
Study of complementary training practices for improving dance performance.

Prerequisite(s): Dance 235 and 363 and consent of the Division Chair, Dance.

Dance 391 **3 units; H(3-0)**

Dance and the Camera
An introduction to making dances for the camera incorporating composing dance for the frame, basic camera skills, story board organization, and basic editing skills, as well as viewing and analysis of dances on film and video.

Prerequisite(s): Dance 333.

Dance 395 **3 units; H(1S-5)**

Dance Performance Practicum II
Further practical experience in dance performance.

Prerequisite(s): Consent of the Division Chair, Dance.

NOT INCLUDED IN GPA

Dance 397 **3 units; H(1S-5)**

Dance Performance Practicum III
Intermediate practical experience in dance performance.

Prerequisite(s): Consent of the Division Chair, Dance.

Corequisite(s): Prerequisite or Corequisite: Dance 395.

NOT INCLUDED IN GPA

Dance 405 **3 units; H(2S-4)**

Intermediate Contemporary Dance II
Further intermediate study of the techniques of contemporary dance.

Prerequisite(s): Dance 307 and audition.

Dance 407 **3 units; H(2S-4)**

Intermediate Contemporary Dance III
This completes the sequence of intermediate study of the techniques of contemporary dance.

Prerequisite(s): Dance 405. Audition required if Dance 405 was not completed in the previous term.

Dance 411 **3 units; H(2S-4)**

Intermediate Jazz Dance I
Intermediate study of the techniques of jazz dance.

Prerequisite(s): Dance 313 and audition.

Dance 413 **3 units; H(2S-4)**

Intermediate Jazz Dance II
Further intermediate study of the techniques of jazz dance.

Prerequisite(s): Dance 411. Audition required if Dance 411 was not completed in the previous term.

Dance 421 **3 units; H(2S-4)**

Intermediate Ballet I
Intermediate study of the techniques of ballet.

Prerequisite(s): Dance 323 and audition.

Dance 423 **3 units; H(2S-4)**

Intermediate Ballet II
Further intermediate study of the techniques of ballet.

Prerequisite(s): Dance 421. Audition required if Dance 421 was not completed in the previous term.

Dance 427 **3 units; H(1-3)**

Cross-Cultural Currents: Embodying Global Dance
Experiential survey of dance practices from around the world.

Note: This course will be offered in alternating years.

Dance 431 **3 units; H(2S-2)**

Creative Process III: Choreography
Continuing focus on developing choreographic structures that support clear artistic statements, with an emphasis on the duet form.

Prerequisite(s): Dance 333 and consent of the Division Chair, Dance.

Antirequisite(s): Credit for Dance 431 and 430 will not be allowed.

Dance 433 **3 units; H(2S-2)**

Creative Process IV: Choreography
Further study in creating choreographic structures with an emphasis on group forms.

Prerequisite(s): Dance 431 and consent of the Division Chair, Dance.

Antirequisite(s): Credit for Dance 433 and 430 will not be allowed.

Dance 449 **3 units; H(2-2)**

Dance Pedagogy
Introduction to theory, methodology and practice of dance instruction.

Prerequisite(s): Dance 307, 363 and one of 313 or 323.

Note: This course will be offered in alternating years.

Dance 475 **3 units; H(2-2)**

Complementary Dance Training Practices II
Focus on select methods of complementary training practices for improving dance performance.

Prerequisite(s): Dance 375.

MAY BE REPEATED FOR CREDIT

Dance 481 **3 units; H(3-0)**

Cross-Cultural Currents: Theorising Dancing Bodies
Critical dance theory and global dance forms.

Prerequisite(s): Dance 243 or 345.

Note: This course will be offered in alternating years.

Dance 491 **3 units; H(3-0)**

Design and Production for Dance
An overview of the essential skills required to light, present and produce dance performance.

Prerequisite(s): 60 units (10 full-course equivalents).

Dance 493 **3 units; H(1-3)**

Dance Teaching Practicum
Practical experience teaching dance in school and recreational settings.

Prerequisite(s): Dance 449 and consent of the Division Chair, Dance.

Antirequisite(s): Credit for Dance 493 and Dance Education 491 or 493 will not be allowed.

Dance 495 **3 units; H(1S-5)**

Dance Performance Practicum IV
Advanced practical experience in dance performance.

Prerequisite(s): Consent of the Division Chair, Dance.

Corequisite(s): Prerequisite or Corequisite: Dance 397.

NOT INCLUDED IN GPA

Dance 503 **3 units; H(3-0)**

Special Topics in Dance Theory II
Prerequisite(s): Consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance 505 **3 units; H(2S-4)**

Advanced Contemporary Dance I
Advanced study of the techniques of contemporary dance.

Prerequisite(s): Dance 407 and audition.

MAY BE REPEATED FOR CREDIT

Dance 507 **3 units; H(2S-4)**

Advanced Contemporary Dance II
Further advanced study of the techniques of contemporary dance.

Prerequisite(s): Dance 505. Audition required if Dance 505 was not completed in the previous term.

MAY BE REPEATED FOR CREDIT

Dance 531 **3 units; H(1S-6)**

Senior Project
Senior choreographic and/or performance project.

Prerequisite(s): Consent of the Division Chair, Dance.

Dance 571 **3 units; H(1S-6)**

Directed Studies
Prerequisite(s): Consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance 574 **6 units; F(0-7)**

Travel Study
An international perspective on dance training, performance and culture.

Prerequisite(s): Consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance 581 **3 units; H(2S-2)**

Special Topics in Dance Practices II
Possible topics include site specific dance, collaborative creation.

Prerequisite(s): Consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance 591 **3 units; H(4 months)**

Professional Dance Internship I
Internship experience with a local professional dance organization.

Prerequisite(s): Dance 407 or 413, 78 units (13 full-course equivalents) and consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Dance 593 **3 units; H(4 months)**

Professional Dance Internship II
Further internship experience with a local professional dance organization.

Prerequisite(s): Dance 591 and consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Graduate Courses

Dance 681 **3 units; H(2S-2)**

Special Topics in Dance
Prerequisite(s): Consent of the Division Chair, Dance.

MAY BE REPEATED FOR CREDIT

Dance Education DCED

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Kinesiology and Physical Education.

Senior Course

Dance Education 325 **3 units; H(1-3)**

Dance in Schools
Content, planning, and teaching methodology in school dance.

Prerequisite(s): Admission to the Leadership in Pedagogy and Coaching Major.

Development Studies DEST

Instruction offered by the Faculty of Arts. Please contact the Department of Anthropology and Archaeology for specific details.

Junior Course

Development Studies 201 **3 units; H(3-0)**

Introduction to Development Studies
An interdisciplinary course focusing on development in both a northern and international context. Explores factors that shape development processes; introduces concepts and issues such as poverty; colonialism and self-determination; human ecology and sustainable development; and appropriate technology. Examines the origins, purposes, and performance of contemporary national and international institutions and their effect on people in different geographical and socio-economic contexts.

Senior Courses

Development Studies 375 **3 units; H(3-0)**

Gender and Development
Examines development from the critical perspective of the key role played by gender in development. Case studies from Canadian and international contexts will provide illustrative material for analysing the issues that emanate from the gendered nature of development processes and practices.

Prerequisite(s): Development Studies 201 or Women's Studies 201.

Development Studies 393 **3 units; H(3-0)**

Theories and Applications of Development
A study of development theories and applications through northern and international case studies. Examines practical manifestations of those theories and approaches in development planning, implementation, and praxis including Modernization theory; dependency theory; basic needs approach; neo-liberalism; the staple thesis; globalization; women in development; gender and development.

Prerequisite(s): Development Studies 201.

Development Studies 400 **6 units; F(9-0)**

Field School
A field course for the on-site interdisciplinary study of a country or region with regard to issues of development from variety of perspectives, e.g., cultural, economic, environmental, geographical, historical and political perspectives.

Prerequisite(s): Consent of the Department.

Development Studies 401 **3 units; H(3-0)**

Special Topics in Development Studies
An examination of selected topics in Development Studies. See Schedule of Classes for current topic(s).

MAY BE REPEATED FOR CREDIT

Development Studies 403 **3 units; H(3-0)**

Sustainability and Human Ecology in the Circumpolar Arctic
The history of northern development and resource management in Canada with emphasis on specific case studies involving sustainability and human ecology in the Circumpolar Arctic. The role of traditional environmental knowledge and its significance to northern development will be examined. Participatory research methodologies may be introduced.

Prerequisite(s): Development Studies 393 or Indigenous Studies 317.

Antirequisite(s): Credit for Development Studies 403 and either Northern Planning and Development 401 and 405 will not be allowed.

Development Studies 405 **3 units; H(3-0)**

Environment and Development
Students will critically engage with sustainability through study of the intersections between environment and development, such as planning and development, management, and implementation, the political economy of environment, and political ecology. Topics may include political and economic systems, resource depletion, industrial agriculture, biodiversity, gender, hazards, traditional knowledge, and resistance.

Prerequisite(s): Development Studies 393 or Anthropology 313 or Indigenous Studies 317.

Development Studies 485 **3 units; H(3S-0)**

International and Intercultural Communication
Examines cross-cultural communication at the personal, organizational, societal, and international levels. Discusses the concept of "Globalization" and its implications for communication among different cultures; analyzes various theoretical perspectives underlying intercultural communication; explores issues of power, identity and influence; examines intercultural encounters in the context of specific diversified settings; and helps students develop intercultural communication competence.

Prerequisite(s): Development Studies 393.

Development Studies 501 **3 units; H(3-0)**

Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Department.

Note: Students should contact the Department at least two weeks prior to the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Development Studies 591 **3 units; H(3S-0)**

Critical Perspectives on Development Practice and Research
An interdisciplinary consideration of selected issues and methodologies in development, which will provide students with the critical perspective and skills needed to conceptualize, design, implement and effectively manage community development projects and programs.

Prerequisite(s): Development Studies 393 and admission to the Development Studies Program.

Development Studies 593 **3 units; H(3S-0)**

Honours Seminar in Development Studies
Current theoretical and methodological issues will be explored in a discussion-based seminar format, with the possibility of development of a research project.

Prerequisite(s): Development Studies 393 and admission to the Development Studies Honours Program.

Drama DRAM

Instruction offered by members of Drama in the School of Creative and Performing Arts in the Faculty of Arts.

Junior Courses

Drama 200 **6 units; F(3S-2)**

Introduction to Acting
Practical experience in acting; improvisation and introductory work from texts; the development of communication skills and personal acting creativity.

Drama 203 **3 units; H(3-0)**
(formerly Fine Arts 203)

Creativity
From the economy to the environment and from politics to entertainment, creativity is an endlessly renewable resource that offers benefits for all citizens and may well be the most important human element for our future. Students from all disciplines can investigate the practices and processes of creativity and explore the ways in which it can help enrich their lives.

Note: Attendance at selected arts events is mandatory. Students are responsible for the purchase of tickets. Affordability and accessibility will influence the selection of events. Drama majors and minors may not count this course towards their field requirements.

Drama 205 **3 units; H(3-0)**
(formerly Fine Arts 205)

Story
An exploration of the elements of story present in the arts and beyond. Story is an exciting, creative, dynamic and universal form of human expression

with the potential to engage and inspire students from across departments and disciplines.

Note: Attendance at selected arts events is mandatory. Students are responsible for the purchase of tickets. Drama majors and minors may not count this course towards their field requirements.

Drama 223 **3 units; H(0-6)**

Introduction to Theatre Production
An introduction to organizational principles of theatre production and technical theatre skills.

Antirequisite(s): Credit for Drama 223 and 222 will not be allowed.

Note: Participation on the production crews of Drama productions outside of scheduled class time is required. This course is required for all Drama majors, but is open to all undergraduate students for registration.

Drama 225 **3 units; H(2-2)**

Introduction to Scenography
An introduction to performance design and the disciplines within it: scenery, props, lighting, costumes and sound. Includes a study of the history of theatre design and space. Topics regarding contemporary notions of scenography will be explored, for example performance art, ritual, etc.

Antirequisite(s): Credit for Drama 225 and 222 will not be allowed.

Note: Attendance at two live theatre performances will be required. This course is required for all Drama majors, but is open to all undergraduate students for registration.

Drama 240 **6 units; F(3-1T)**

Introduction to Drama
Interpretation and study of dramatic genres related to Drama's season of plays; introduction to play analysis.

Senior Courses

The following listing is provided to assist students in their selection of related groups of Drama courses:

Acting and Directing

300, 400, 410, 500, 510

Design and Technical

313, 317, 319, 320, 321, 381, 419, 423, 481, 517

Dramatic Literature, Criticism, History, Theory

340, 342, 344, 355, 357, 440, 540

Theatre for Young Audiences and Developmental/Performance Drama

360, 362, 460, 560

Senior Option Courses

371, 471, 571, 572

Production Courses

391, 393, 491, 493, 591, 593

Graduate Courses

605, 607, 610, 623, 625, 627, 629, 647, 649, 651, 660, 671, 673

Drama 300 **6 units; F(2S-4)**

Advanced Acting I
Further development of fundamental acting techniques; participation in Drama's season of plays may be required.

Prerequisite(s): Drama 200 and consent of the Division Chair, Drama.

Drama 313 **3 units; H(2S-2)**

Scenography I
Basic scenography including set, props, lighting and costume design theory, process and technique for a variety of theatre forms and performance styles.

Corequisite(s): Prerequisite or Corequisite: Drama 319.

Antirequisite(s): Credit for Drama 313 and either 415 or 417 will not be allowed.

Drama 317 **3 units; H(2S-2)**

Introduction to Stage Sound
Basic principles of sound for the theatre: recording, reinforcement and reproduction techniques and methods used in creating a production design.

Prerequisite(s): Drama 223 and 225.

Note: This course meets for two hours per week during the Fall and Winter Terms.

Drama 319 **3 units; H(2S-2)**

Graphics and Model Building for Theatre
An introduction to graphic and model building techniques for the theatre designer.

Prerequisite(s): Drama 223 and 225.

Drama 320 **3 units; H(2S-2)**

Introduction to Lighting Design
Basic principles of lighting for live performance including conceptualization of the lighting approach, techniques in communication and skills in execution of a performance.

Corequisite(s): Prerequisite or Corequisite: Drama 319.

Antirequisite(s): Credit for Drama 320 and 315 will not be allowed.

Drama 321 **3 units; H(2S-2)**

Stage Management
Principles of stage management; a stage management project related to one of the presentations in Drama's season of plays.

Prerequisite(s): Drama 223 and 225.

Note: This course meets for two hours per week during both the Fall and Winter Terms.

Drama 340 **6 units; F(4S-0)**

Seminar in Drama I
Critical examination of plays performed in Drama's season; staging requirements for contemporary productions and other works by the same authors and their contemporaries may also be studied.

Prerequisite(s): Drama 240.

Drama 342 **6 units; F(3-0)**

History of the Theatre: Origins to the Late Eighteenth Century
Theatre as an art and social phenomenon in selected cultures, emphasizing the development of Western traditions.

Drama 344 **6 units; F(3-0)**

History of the Theatre: The Late Eighteenth Century to the Present
Popular and elite traditions of theatre in Western Europe and North America.

Drama 355 **3 units; H(3S-0)**

Early to Modern Canadian Theatre and Drama
History, literature and cultural milieu of Canadian theatre from its colonial origins through the 1970s.

Antirequisite(s): Credit for Drama 355 and 356 will not be allowed.

Drama 357 **3 units; H(3S-0)**

Contemporary Canadian Theatre and Drama
History, Literature and cultural milieu of Canadian theatre since the 1980s.

Antirequisite(s): Credit for Drama 357 and 356 will not be allowed.

Drama 360 **6 units; F(2S-2)**

Performance Creation I
Explorations in personal/group creative process; facilitation of performance forms that may include sound and movement exploration, storytelling, ritual, mask, puppetry, and the collaborative creation of original performance. Theory and history of performance creation is integrated with practical experience.

Antirequisite(s): Credit for Drama 360 and 366 will not be allowed.

Drama 362 **6 units; F(2S-2)**

Theatre for Young Audiences
Exploration of performance techniques specific to Theatre for Young Audiences (TYA) content, forms and venues. Study of the history and production of TYA, as well as the creation of original performances. There is a performance component that includes tours in the community.

Prerequisite(s): Drama 200.

Drama 371 **3 units; H(2S-2)**

Introduction to Playwriting
Directed exercises in writing for the theatre; workshop sessions for developing and reworking material.

Prerequisite(s): Drama 200, 223, 225 and 240.

Drama 381 **3 units; H(2-2)**

Topics in Scenography
Special topics in the study of scenography and techniques for the scenographer.

381.01. History of Costume

381.02. History of Interiors

381.03. History of Scenography

381.04. Costume Techniques

381.05. Scenic Art

381.06. Digital Media for the Theatre

381.07. Make-Up for the Stage

Note: The courses will be offered on a three year schedule, two per academic year. You must plan your schedule accordingly.

Drama 391 **3 units; H(0-6)**

Performance Practicum I
Practical experience in theatrical production.

Prerequisite(s): Drama 200, 223, 225 and 240 and consent of the Division Chair, Drama.

Note: Students must submit an application and identify a supervisor before being considered for this course.

Drama 393 **3 units; H(0-6)**

Performance Practicum II
Further practical experience in theatrical production.

Prerequisite(s): Drama 391 and consent of the Division Chair, Drama.

Note: Students must submit an application and identify a supervisor before being considered for this course.

Drama 400 **6 units; F(3S-6)**

Advanced Acting II
Further study in the techniques of acting; performance in Drama's season of plays may be required.

Prerequisite(s): Drama 300 and consent of the Division Chair, Drama.

Drama 410 **6 units; F(2-2)**

Fundamentals of Directing
Theories and practical techniques of directing plays; students may be required to observe or assist faculty directors. Studies will be co-ordinated with Drama's season of plays whenever possible.

Prerequisite(s): Drama 200, 223, 225 and 340.

Drama 419 **3 units; H(2-2)**

Scenography II
Set design and scenography for a variety of contemporary theatre forms and genres. Topics will include set, costume, lighting and projection for live performance.

Prerequisite(s): Drama 313 or consent of the Division Chair, Drama.

Drama 423 **3 units; H(2-2)**

Scenography III
Continuation of Drama 419 with a heightened emphasis on individual creation process.

Prerequisite(s): Drama 419.

Drama 440 **6 units; F(4S-0)**

Seminar in Drama II
Critical study of plays in Drama's season of plays suited to students in their third and fourth years; critical analysis and historical interpretation is integrated with a careful consideration of requirements for staging; plays generically or historically related may also be studied.

Prerequisite(s): Drama 340.

Drama 460 **6 units; F(2S-2)**

Performance Creation II
Advanced exploration of personal/group creative process; facilitation of a variety of improvisation and interactive theatre forms; solo/group performance creation. Theories and history of performance creation are integrated with practical experience.

Prerequisite(s): Drama 360.

Drama 471 **3 units; H(2S-2)**

Playwriting
Intermediate studies in writing for the theatre leading to the development of a one-act or full-length piece; workshop sessions for developing and rehearsing material.

Prerequisite(s): Drama 371 and consent of the Division Chair, Drama.

Drama 481 **3 units; H(2-2)**

Advanced Topics in Scenography
Possible topics include, but are not limited to: Scenic Art and Digital Techniques, Advanced Make-up and Prosthetics, Textile Manipulation, Projected Media for Live Performance, Advanced Scenic Painting, Advanced Lighting Design, Wearable Electronics and the Stage, Design for Devised Theatre, Professional Practice.

Prerequisite(s): Drama 313.

MAY BE REPEATED FOR CREDIT

Drama 491 **3 units; H(0-6)**

Performance Practicum III
Further practical experience in theatrical production.

Prerequisite(s): Drama 393 and consent of the Division Chair, Drama.

Note: Students must submit an application and identify a supervisor before being considered for this course.

Drama 493 **3 units; H(0-6)**

Performance Practicum IV
Further practical experience in theatrical production.

Prerequisite(s): Drama 491 and consent of the Division Chair, Drama.

Note: Students must submit an application and identify a supervisor before being considered for this course.

Drama 500 **6 units; F(3S-6)**

Advanced Acting III
Interpretation of roles and special problems in performance; performance in Drama's season of plays may be required.

Prerequisite(s): Drama 400 and consent of the Division Chair, Drama.

Drama 510 **6 units; F(2S-3)**

Advanced Directing
Problems in play directing; the directing of scenes and a short play; the preparation of a promptbook; history of directing; participation as an assistant to the director in Drama's season of plays may be required.

Prerequisite(s): Drama 410 and consent of the Division Chair, Drama.

Drama 517 **3 units; H(2S-2)**

Scenography IV
Advanced set, props, lighting, and costume design theory, process and technique for a variety of theatre forms and performance styles.

Prerequisite(s): Consent of the Division Chair, Drama.

Note: This course will provide students with an opportunity to practice scenography in connection to a live performance in the Drama season.

Drama 540 **6 units; F(4S-0)**

Seminar in Drama III
Critical study at an advanced level of the dramatic metaphor as presented in Drama's season of plays; intensive focus on the historical period and theatrical genre of one or two of the season's plays especially.

Prerequisite(s): Drama 440.

Drama 560 **6 units; F(2S-2)**

Performance Creation III
Independent research, creation and facilitation of original solo or group performances.

Prerequisite(s): Drama 460.

Drama 564 **6 units; F(2S-2)**

Drama Education
Research into the nature and function of drama education across a variety of age levels and learning environments. Practical experience in structuring learning activities, developing classroom controls and facilitating creative process and performance may be included.

Prerequisite(s): Drama 360 and admission to the Drama or Drama Education program.

Note: This course is open to other students with permission of the Division Chair.

Drama 571 **3 units; H(2S-0)**

Directed Studies I
MAY BE REPEATED FOR CREDIT

Drama 572 **6 units; F(2S-0)**

Directed Studies II
Prerequisite(s): Consent of the Division Chair, Drama.

MAY BE REPEATED FOR CREDIT

Drama 573 **3 units, H(3S-0)**

Dramaturgy
Theory and core principles of dramaturgy.

Prerequisite(s): Consent of the Division Chair, Drama.

Antirequisite(s): Credit for Drama 573 and either Drama 571.23 or 571.30 will not be allowed.

Graduate Courses

Drama 605 **3 units; H(4S-0)**

Methods in Theatre Research
Methods in research in the four areas of specialization in the MFA Theatre program.

Note: Required of all students enrolled in the MFA Theatre program.

Drama 607 **3 units; H(2S-2)**

Director, Designer, and Mise-en-scene
Advanced collaborative methods and techniques for directors, designers and dramaturges, leading to the creation of a mise-en-scene for selected plays of varying styles and genres.

Drama 610 **6 units; F(2S-3)**

Selected Problems in Directing

Drama 623 **3 units; H(2S-2)**

Seminar in Scene Design
MAY BE REPEATED FOR CREDIT

Drama 625 **3 units; H(2S-2)**

Seminar in Costume Design
MAY BE REPEATED FOR CREDIT

Drama 627 **3 units; H(2S-2)**

Seminar in Lighting Design
MAY BE REPEATED FOR CREDIT

Drama 629 **3 units; H(2S-2)**

Seminar in Technical Direction
MAY BE REPEATED FOR CREDIT

Drama 647 **3 units; H(3S-0)**

Studies in Modern Drama I
Studies in the literature, history, theory and criticism of drama, theatre and performance from the late nineteenth century to the mid-twentieth century.

Drama 649 **3 units; H(3S-0)**

Studies in Modern Drama II
Studies in the literature, history, theory and criticism of drama, theatre and performance from the mid twentieth century to the present.

Drama 651 **3 units; H(2S-0)**

Directed Studies
MAY BE REPEATED FOR CREDIT

Drama 660 **6 units; F(2S-3)**

Seminar and Practicum in Performance Creation

Drama 671 **3 units; H(3S-0)**

Selected Problems in Playwriting I

Drama 673 **3 units; H(3S-0)**

Selected Problems in Playwriting II

Earth Science EASC

Instruction offered by members of the Faculty Science and the Faculty of Arts.

Limited amounts of non-scheduled class time involvement will be required for these courses.

Senior Courses

Earth Science 401 **3 units; H(2-3)**

Methods in Earth Science
An introduction to field and laboratory methods used in earth surface processes research. Field excursions may involve travel and will provide the basis for laboratory exercises.

Prerequisite(s): Archaeology 201; Chemistry 201 or 211; Geology 201, 202 or 203; Geography 211 and 231 and admission to the Earth Science Program.

MAY BE REPEATED FOR CREDIT

Earth Science 501 **3 units; H(3-3)**

Research Project in Earth Science
An original research project that focuses on earth surface processes and may target local, regional, or global issues. Participants will be exposed to: (1) oral and written communication, (2) field sampling techniques and strategies, (3) laboratory techniques, strategies and limitations, and (4) relevant statistical analysis and graphic communication.

Prerequisite(s): Consent of the Program Coordinator

MAY BE REPEATED FOR CREDIT

East Asian Language Studies EALS

Instruction offered by members of the Department of Linguistics, Languages, and Culture in the Faculty of Arts.

Senior Course

East Asian Language Studies 501 **3 units; H(3-0)**

Topics in the East Asian Languages Studies
A research-oriented course that will allow students to synthesize their training in East Asian languages and cultures and bring it to bear on a particular subject in Chinese and/or Japanese, or on the relation between East Asian languages and their respective cultures. Students will meet with the instructor individually and regularly in order to discuss their respective research projects.

Prerequisite(s): Consent of the Department.

Note: Open only to majors in East Asian Language Studies.

East Asian Studies EAST

Instruction offered by the Department of Linguistics, Languages, and Culture in the Faculty of Arts. Students are encouraged to consult the Department website (llc.ucalgary.ca/) for more details on course descriptions and titles of decimalized courses.

East Asian Studies 201 **3 units; H(3-0)**

Understanding Contemporary East Asia
An introductory exploration of the contemporary cultures of China, Japan, and Korea that outlines their shared characteristics as well as highlighting their differences. Subjects covered include physical environment, history, philosophy, social and political order, economy, and arts.

Antirequisite(s): Credit for East Asian Studies 201 and 317 will not be allowed.

Senior Courses

East Asian Studies 319 **3 units; H(3-0)**

East Asian Values in a Canadian Setting
Examines the presence of East Asian values within Canada, their potential for greater acceptance in and contribution to Canadian life, and changes that would facilitate the acceptance of East Asians into the Canadian mainstream. East Asian values will be examined generically, as well as specifically to the cultures of China, Japan, Korea and Vietnam.

Antirequisite(s): Credit for East Asian Studies 319 and General Studies 301.04 will not be allowed.

Note: Previous course work in East Asian culture would be advantageous to the student.

East Asian Studies 321 **3 units; H(3-0)**

Introduction to the Calgary Chinese Community
Provides instruction on the direct experience of important aspects of the Calgary Chinese community, including its history, commercial sector, entertainment facilities, and its cultural, social, and religious organizations.

Antirequisite(s): Credit for East Asian Studies and General Studies 301.06 will not be allowed.

Note: Course requires off-campus attendance with a considerable amount of walking involved.

East Asian Studies 331 **3 units; H(3-0)**

Development of East Asia: China, Korea, Vietnam
Major traditions in these mainland East Asian civilizations and their historic foundations. These traditions include historical, linguistic, ideological, societal, religious, political, economic, literary, artistic and aesthetic developments. Attention will be given to how these traditions have combined to create each civilization as well as an East Asian identity that differs from that of other major civilizations.

Antirequisite(s): Credit for East Asian Studies 331 and East Asia 300 will not be allowed.

East Asian Studies 333 **3 units; H(3-0)**

Development of East Asia: Japan
Major traditions in Japanese civilization and their historic foundations. These traditions include historical, geographic, linguistic, ideological, societal, religious, political, economic, artistic, and aesthetic developments. Attention will be given to how these traditions have combined to create the Japanese nation as well as contribute to an East Asian identity that differs from that of other major civilizations.

Antirequisite(s): Credit for East Asian Studies 333 and East Asia 300 will not be allowed.

East Asian Studies 499 **3 units; H(3-0)**

Topics in East Asian Studies
Investigation of themes and methodologies related to the study of East Asian civilizations. A single theme related to a single civilization or one related to them all or the study and application of one or more methods employed in East Asian Studies may be offered. Themes/methods will vary among offerings.

499.01. Methods in East Asian Studies

499.02. Contemporary Issues in East Asia

499.03. Topics in the History of East Asia

Prerequisite(s): East Asia 300 or East Asian Studies 331 and East Asian Studies 333.

Note: Only open to students with credit in East Asia 500 with consent of the Department.

East Asian Studies 531 **3 units; H(3-0)**

Issues in East Asia
Social, philosophical, economic, political and/or international issues within East Asia and analysis of the basis for interactions among East Asian countries and across the Pacific will be presented in-depth.

Prerequisite(s): East Asia 300 or East Asian Studies 331 and 333.

Antirequisite(s): Credit for East Asian Studies 531 and East Asia 500 will not be allowed.

Ecology ECOL

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.

†Limited amounts of non-scheduled class time involvement will be required for these courses.

Senior Courses

Ecology 413 **3 units; H(140 hours)**

Field Course in Ecology
An examination of ecological principles and techniques through field exercises, including studies of terrestrial and aquatic populations, communities and ecosystems. The course is held at the Kananaskis Centre for Environmental Research in the two

weeks immediately prior to the commencement of the Fall Term.

Prerequisite(s): Biology 313 and 315.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar. A supplementary fee will be assessed to cover additional costs associated with this course.

†Ecology 417 **3 units; H(3-3)**

Aquatic Communities and Ecosystems
Community composition and dynamics at the various trophic levels of aquatic ecosystems. Temporal and spatial changes in community composition, physical and chemical conditions, and their effects on the ecosystem. There will be a full week-end field trip, normally during the first or second week of the term.

Prerequisite(s): Biology 313 and one of Biology 315 or Environmental Science 401.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Ecology 419 **3 units; H(3-3)**

Terrestrial Communities and Ecosystems
Processes and patterns in above- and below-ground terrestrial communities. Ecosystem level processes in fluxes of carbon and nutrients. Methods for assessing biomass, productivity and biochemical pathways.

Prerequisite(s): Biology 313 and one of Biology 315 or Environmental Science 401.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Ecology 425 **3 units; H(3-3)**

Quantitative Biology II
Quantitative analysis as applicable to ecological research. Methodologies and models will be presented and analyzed. Particular emphasis will be placed on experimental design, regression analysis, and the study of spatial dispersion.

Prerequisite(s): Biology 313 and 315.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Ecology 429 **3 units; H(3-3)**

Ecology of Individuals
Ecological and evolutionary perspectives on physiology and behaviour. This course focuses on the influences on resource acquisition, maintenance, growth, and reproduction and their implications for survival and fertility.

Prerequisite(s): Biology 313 and 315.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Ecology 439 **3 units; H(3-3)**

Ecology of Populations
A conceptual and practical treatment of population ecology including: population growth, demography, life histories, population dynamics, competition, predation and mutualism.

Prerequisite(s): Ecology 425 and 429.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Ecology 501 **3 units; H(0-3)**

Ecological and Evolutionary Applications
A class project course in which students apply their understanding of ecological and evolutionary concepts and their analytical skills to investigate selected problems in detail. Project topics vary from year to year and will include fundamental and applied problems. Formal written and oral reports will be presented as a necessary component of the course.

Prerequisite(s): Ecology 425, 429 and one of 417 or 419; and 75 units (12.5 full-course equivalents).

Note: Prior or concurrent completion of Biology 401, Ecology 419 and 439 are strongly recommended. Ecology 501 is intended to draw on experience gained throughout the Ecology program, and should be taken by students in the final year of the program.

Ecology 507 **3 units; H(0-8) or H(3-0)**

Special Problems in Ecology
Independent research or reading project that may include seminars, lectures, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 54 units (9.0 full-course equivalents) and consent of the Department.

Note: Students completing a typical course sequence in their program would normally be eligible to enrol in their 3rd or 4th year. After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

MAY BE REPEATED FOR CREDIT

Ecology 527 **3 units; H(3-1T)**

Ecology of Fishes
The ecology of fishes with an emphasis on freshwater systems. Fish will be used as models for examining ecological principles and theory at various levels of organization including physiological, behavioural, population and community ecology. Topics covered include: morphology, systematics, foraging, bioenergetics, life history strategies, population dynamics and the role of fish in aquatic food webs.

Prerequisite(s): Biology 313 and one of Ecology 417 or Zoology 477.02.

Note: Offered during even-odd dated academic years.

Ecology 528 **6 units; F(0-8)**

Independent Studies in Ecology
Original and independent thought, practical research and the completion of written and oral reports.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

MAY BE REPEATED FOR CREDIT

Ecology 529 **3 units; H(3-0)**

Molecular Ecology and Evolution
Molecular Ecology utilizes population genetics, phylogenetics, and genomics to address questions in ecology, evolution, behaviour and conservation. Topics will include principal and emerging molecular techniques for characterizing and analysing genetic variation to test quantitative predictions from ecological and evolutionary theory.

Prerequisite(s): Biology 311 and 313.

Ecology 530 **6 units; F(0-8)**

Honours Research Project in Ecology
Research project under the direction of one or more faculty members in the Department of Biological Sciences. Formal written and oral reports must be presented on completion of this course. Open only to Honours Ecology students or Honours Biological Sciences students.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

Graduate Courses

Enrolment in any graduate course requires consent of the Department.

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599. 600-level courses are available with permission to undergraduate students in the final year of their programs.

Ecology 603 **3 units; H(3-0)**

Advanced Behavioural Ecology
Current problems and recent research in areas of particular significance. Topics will vary from year to year.

Note: Offered during even-odd dated academic years.

MAY BE REPEATED FOR CREDIT

Ecology 607 **3 units; H(0-6)**

Limnology and Oceanography
Lectures, seminars and projects in the areas of limnology, aquatic ecology and oceanography.

Ecology 677 **3 units; H(0-6)**

Advanced Population Ecology
The theory and practice of the study of populations, methods of population estimation, factors affecting populations, and systems approaches to the modelling of populations.

MAY BE REPEATED FOR CREDIT

Ecology 731 **3 units; H(3-0)**

Advanced Plant Ecology
Current problems and recent research in areas of particular significance. Topics will vary from year to year.

MAY BE REPEATED FOR CREDIT

Economics ECON

Instruction offered by members of the Department of Economics in the Faculty of Arts.

Junior Courses

Economics 201 **3 units; H(3-1T)**

Principles of Microeconomics
Principles of consumption, production, exchange: market and firm equilibrium under different competitive conditions. These principles are applied to various contemporary problems in the Canadian economy, such as the changing structure of agriculture, foreign ownership and control, and pollution.

Economics 203 **3 units; H(3-1T)**

Principles of Macroeconomics
National income determination, the monetary and banking system, and elementary fiscal and monetary policies. Contemporary problems of unemployment, inflation, economic growth, business cycles and the international economy.

Corequisite(s): Prerequisite or Corequisite: Economics 201.

Economics 209 (Engineering 209) **3 units; H(3-1T)**

Engineering Economics
The basic tools and methodology of engineering economic studies. Topics include investment decisions, theory of replacement, economies of scale, externalities, social decision making and government regulation. Examples are drawn from engineering projects.

Prerequisite(s): Registration in the Faculty of Engineering with second year standing or higher. If not registered in the Schulich School of Engineering, consent of the Department of Economics. If required for APEGA, consent of the Schulich Undergraduate Studies Office.

Senior Courses

Economics 301 **3 units; H(3-1T)**

Intermediate Economic Theory - Microeconomics I
Demand, production and costs in a market economy. Pricing in perfectly and imperfectly competitive markets.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 or equivalent; Economics 201 and 203.

Economics 303 **3 units; H(3-1T)**

Intermediate Economic Theory - Macroeconomics I
Introduction to the analysis of macroeconomic issues including the causes of recessions and unemployment, the determination of exchange rates, and the effects of government policies.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 or equivalent; Economics 201 and 203.

Economics 311 **3 units; H(3-0)**

Computer Applications in Economics
Use of spreadsheets for economics applications, including project evaluation with financial-economic functions, oil and gas prospect evaluation, investment portfolio management with database functions, database retrieval, and various topics in micro- and macro-economics.

Prerequisite(s): Economics 201 and 203.

Economics 321 **3 units; H(3-0)**

The Global Trading System
Introduction to the theory of international trade; provides a basis for examining Canadian trade policy, and regional and world trade institutions such as the WTO and NAFTA. Topics include: tariffs, non-tariff barriers and enhancements, countervail and anti-dumping action, multinational enterprises and international joint ventures.

Prerequisite(s): Economics 201 and 203.

Economics 323 **3 units; H(3-0)**

Natural Gas Markets
Operation of the natural gas industry in North America. Economics of exploration, development, production, marketing and transportation of natural gas. Impact of government regulations and deregulation.

Prerequisite(s): Economics 201 and 203.

Economics 325 **3 units; H(3-0)**

The North American Oil Industry
An introduction to the crude oil industry in North America, focusing on exploration, development, and production. Topics include Canadian and US oil policies, environmental policy, industry taxation, and royalty regimes.

Prerequisite(s): Economics 201 and 203.

Economics 327 **3 units; H(3-0)**

Petroleum Economics
A non-technical introduction to the economics of petroleum production, crude oil markets, and refining economics. The course focuses on global crude oil and refined product markets.

Prerequisite(s): Economics 201 and 203.

Economics 329 **3 units; H(3-0)**

Electricity Markets
Economic analysis of the deregulated electric power industry including the pricing of power, energy and capacity, power supply and demand, market structure, market architecture, and the design and testing of market rules.

Prerequisite(s): Economics 201 and 203.

Economics 337 **3 units; H(3-0)**

Development Economics
An introduction to developing economies: the meaning, significance and purpose of economic development, major theories of economic development, economic problems of developing countries.

Prerequisite(s): Economics 201 and 203.

Economics 339 **3 units; H(3-0)**

Canadian Economic Development
The growth and development of the Canadian economy in relation to the endowment of natural resources, changing market conditions and technology, and Canadian public policy.

Prerequisite(s): Economics 201 and 203.

Economics 341 **3 units; H(3-0)**

Money and Banking
Operation of financial markets and institutions: the principles of money creation, interest rate determination, and central banking.

Prerequisite(s): Economics 201 and 203.

Economics 345 **3 units; H(3-0)**

Economic Analysis of Law
An introduction to the relationship between law and economics. Economic theory will be used to analyze property and tort law.

Prerequisite(s): Economics 201.

Economics 349 **3 units; H(3-0)**

The Economics of Social Problems
Contribution that economic analysis can make to the understanding of selected current social issues such as poverty, aging, crime, drug abuse and discrimination.

Prerequisite(s): Economics 201 and 203.

Economics 353 **3 units; H(3-0)**

Chinese Economy
Survey of the economic institutions and processes shaping the Chinese economy, including but not limited to fiscal and monetary policy, financial institutions and financial sector reforms, the restructuring of state-owned enterprises, and the provision of social welfare.

Prerequisite(s): Economics 201 and 203.

Antirequisite(s): Credit for Economics 353 and Economics 399.02 will not be allowed.

Economics 355 **3 units; H(3-0)**

Canadian Public Finance
Examination of the institutions behind and economic rationale for Canadian government policy relating to public expenditures and taxation. Topics include the history and present structure of government spending and taxation, tax expenditures, the budgetary process, inter-jurisdictional issues, and program design.

Prerequisite(s): Economics 201 and 203.

Economics 357 **3 units; H(3-1T)**

Intermediate Economic Theory - Microeconomics II
Extensions of microeconomic topics such as factor markets, general equilibrium, and welfare economics.

Prerequisite(s): Economics 301 and one of Mathematics 249, 251, 265 or 281.

Antirequisite(s): Credit for Economics 357 and either 309 or 529 will not be allowed.

Economics 359 **3 units; H(3-1T)**

Intermediate Economic Theory - Macroeconomics II
Extensions of macroeconomic topics such as theories of aggregate consumption and investment, interest rate theory, the demand for money, expectations in macro models and growth theory.

Prerequisite(s): Economics 303 and one of Mathematics 249, 251, 265 or 281.

Antirequisite(s): Credit for Economics 359 and either 313 or 531 will not be allowed.

Economics 365 **3 units; H(3-0)**

Regional Economics
The nature of economic regions. Choosing regions for development, regional income estimation and social accounting, inter-regional flow analysis, location theory, theory of regional growth and planning.

Prerequisite(s): Economics 201 and 203.

Economics 371 **3 units; H(3-0)**

Economic Analysis of Transportation
Modal choice by passengers, location choice by firms, capital investment choice. Cost, demand, and market structure related to the determination of transportation rates. Cost/Benefit analysis of transportation projects. Analysis will be related to contemporary aspects of ocean shipping, air, rail, trucking, pipelines and urban transportation.

Prerequisite(s): Economics 201 and 203.

Economics 373 **3 units; H(3-0)**

Game Theory and Strategic Thinking for the Social Sciences
An introduction to the principles of game theory utilizing a non-mathematical and intuitive approach. The principles of strategic thinking are illustrated by application and examples in economics and other social sciences. The course objective is to develop the ability of students to reason strategically and to understand how game theory can be used to explain social interaction.

Prerequisite(s): Economics 201 and 203.

Economics 377 **3 units; H(3-0)**

Economics and the Environment
An introduction to the analysis of environmental problems from an economic perspective. Issues such as air and water quality, biodiversity and endangered species will be addressed from local as well as global views.

Prerequisite(s): Economics 201 and 203.

Economics 379 **3 units; H(3-0)**

The Economics of Health
Theories and evidence regarding demand for health and health care, consumer and physician behaviour, asymmetric information in health care markets, and economic evaluation of health care programs.

Prerequisite(s): Economics 201 and 203.

Economics 387 **3 units; H(3-0)**

Introduction to Mathematical Economics I
Essential mathematical background for studying Economics: basic techniques of linear algebra and calculus, including unconstrained and constrained optimization, and their applications to resource allocation problems.

Prerequisite(s): Economics 201 and 203; Mathematics 211; and one of Mathematics 249, 251, 253, 265 or 281.

Corequisite(s): Prerequisites or Corequisites: Economics 301 and 303.

Antirequisite(s): Credit for Economics 387 and either 304 or 521 will not be allowed.

Economics 389 **3 units; H(3-0)**

Introduction to Mathematical Economics II
Further essential mathematical background for studying Economics, including exponential and logarithmic functions, eigenvalues and eigenvectors, quadratic forms, integration, and basic methods of dynamic analysis, and their applications to resource allocation problems.

Prerequisite(s): Economics 387.

Antirequisite(s): Credit for Economics 389 and 304 will not be allowed.

Economics 395 **3 units; H(3-1)**

Use of Statistics in Economics
Lectures: The use of statistical principles in economics. Topics include: the gathering of economic data; basic data manipulation and hypothesis testing; and the statistical estimation of economic relationships. The two-variable linear regression model is introduced. Laboratory: Quantitative analysis using standard statistical software.

Prerequisite(s): Economics 201 and 203 and Statistics 205, 211 or 213.

Antirequisite(s): Credit for Economics 395 and 315 will not be allowed.

Economics 399 **3 units; H(3-0)**

Selected Topics in Economics I
A decimalized course in which topics will vary from year to year. Consult the timetable or the Department for the topics available in a given year.

Prerequisite(s): Economics 201 and 203.

MAY BE REPEATED FOR CREDIT

Economics 401 **3 units; H(3-0)**

Public Sector Economics: Expenditures
Theory of government spending. Topics include the nature of public goods and externalities, the pricing of public services, causes of growth of public expenditures, expenditure incidence, social insurance, social decision procedures, and political and bureaucratic influences.

Prerequisite(s): Economics 303 and 357.

Economics 403 **3 units; H(3-0)**

Public Sector Economics: Taxation
Theory of taxation. Topics include the rationale for and the incentive effects of taxation, efficiency and equity aspects of taxation, partial and general equilibrium tax incidence, open economy effects, choice of governing instruments, and tax reform.

Prerequisite(s): Economics 303 and 357.

Economics 405 **3 units; H(3-0)**

Political Economy of Public Policy
Introduction to the economic foundations of political economy and economic models of public sector policy formation. Potential topics are the role of institutions in policy design, theories of bureaucracy, political business cycles, the formation and behaviour of interest groups, and the strategic use of government debt.

Prerequisite(s): Economics 303 and 357.

Economics 423 **3 units; H(3-0)**

International Macroeconomics
Foreign exchange markets, and international macroeconomic connections with trade in assets as well as goods and services. Topics include: alternative exchange rate regimes; monetary and fiscal policy responses to problems of unemployment and inflation; balance of payments adjustment mechanisms; international debt; and Euro-dollar markets.

Prerequisite(s): Economics 359.

Economics 425 **3 units; H(3-0)**

International Trade
The general equilibrium treatment of the gains from trade, comparative advantage and trade patterns provides a basis for examining topics such as: trade policy under imperfect competition, trade policy and the environment, trade policy and economic growth, and preferential trading arrangements.

Prerequisite(s): Economics 357.

Note: Completion of Economics 321 is recommended but not necessary.

Economics 427 **3 units; H(3-0)**

Energy Economics and Policy
Microeconomic analysis of the allocation of energy resources with a focus on policy issues including the environment, OPEC, national security, price and entry regulation, market design, and the potential for new energy sources.

Prerequisite(s): Economics 301, 357, and 395.

Economics 431 **3 units; H(3-0)**

The Canadian Labour Market
Economic analysis of migration, labour force participation, education, fertility, manpower policy, and the measurement and treatment of unemployment.

Prerequisite(s): Economics 301 and 303.

Economics 433 **3 units; H(3-0)**

Wage Determination
Wage and income determination; policies dealing with employment discrimination; and income redistribution.

Prerequisite(s): Economics 357.

Economics 453 **3 units; H(3-0)**

Cost-Benefit Analysis
Theoretical basis for social cost-benefit analysis, appraisal techniques for investment projects and public policies, and selected applications.

Prerequisite(s): Economics 357.

Economics 465 **3 units; H(3-0)**

Industrial Development of Alberta
Structure, growth and development of the provincial economy; evaluation of industrial projects and policy alternatives.

Prerequisite(s): Economics 301 and 303.

Economics 471 **3 units; H(3-0)**

Industrial Organization
Behaviour of firms in imperfectly competitive markets. Topics include the theory of strategic competition; dynamic price competition and tacit collusion; product differentiation, product selection, and preemption; entry deterrence and capacity competition; information, reputation, and predation; the economics of research and development; international trade and imperfectly competitive markets.

Prerequisite(s): Economics 357.

Economics 473 **3 units; H(3-1)**
(formerly Economics 499.40)

Water Resource Economics and Policy
Selected economic issues in water resource use in Canada and other countries, including policies toward, and management of, water allocation, water quality, and the value of water for ecosystem services.

Prerequisite(s): Economics 301.

Economics 475 **3 units; H(3-0)**

Economics of Natural Resources
Application of economic theory to the problems of natural resource pricing, allocation and conservation. Rent theory, location theory, intertemporal maximization. Natural resource policy formulation. Contemporary Canadian resource problems.

Prerequisite(s): Economics 357.

Economics 477 **3 units; H(3-0)**

Regulatory Economics
An introduction to economic regulation, its rationale, form and effects with a focus on the economic theory of regulation and on the practice, structure, and evolution of Canadian regulatory institutions.

Prerequisite(s): Economics 471.

Economics 479 **3 units; H(3-1)**

Experimental Economics
Introduces students to the use of and insights gained from experiments in economic research. Develops many of the concepts from Economics 301 and 357, shedding new light on the assumptions of rationality, the design of markets, and the implementation of market institutions. Covers not only experimental methods, but also reviews some of the most important papers in the field. As part of the course, students will be participating in a variety of in-class experiments.

Prerequisite(s): Economics 357 and 395.

Economics 481 **3 units; H(3-0)**

Behavioural Economics
Major factors underlying economic behaviour including: various views of the role of rationality in economic analysis and in the economic decision making of individuals and institutions; determinants of individual preferences and decision making procedures; the experimental analysis of economic behaviour; inter-relations between the operation of the economic system and feelings of subjective well-being.

Prerequisite(s): Economics 357.

Economics 483 **3 units; H(3-0)**

History of Economic Thought
Traces the evolution of economic ideas from the earliest times up to and including the contributions of the classical economists and Marx. Emphasis will be on understanding these contributions both in terms of their historical context and their relationship to present-day theories and controversies.

Prerequisite(s): Economics 301 and 303.

Economics 485 **3 units; H(3-0)**
(formerly Economics 599.10)

Economics of the Welfare State
This is a course in Public Economics. The focus is on ideas and economic analysis relevant to understanding the economics of the welfare state, where issues of income redistribution and social insurance are central.

Prerequisite(s): Economics 357 and 395.

Antirequisite(s): Credit for Economics 485 and 599.10 will not be allowed.

Economics 487 **3 units; H(3-0)**
(formerly Economics 499.77)

Environmental Economics
This course applies microeconomic theory to the examination of market failures as the source of environmental problems, and to designing and evaluating environmental policies to correct them.

Prerequisite(s): Economics 357 and 395.

Economics 489 **3 units; H(3-0)**
(formerly Economics 499.63)

Economics of the Movie Business
This course applies microeconomic theory to the motion-picture industry, focusing on how information and extreme uncertainty shape the structure of economic transactions. The historical and institutional illustrations are set in the context of Hollywood.

Prerequisite(s): Economics 357 and 395.

Economics 491 **3 units; H(3-0)**

Managerial and Decision Economics
Systematic economic analysis in managerial decision-making. Application of practical ideas to business decisions, integrating global business issues and practices with conceptually rigorous economic analysis.

Prerequisite(s): Economics 357 and 395.

Antirequisite(s): Credit for Economics 491 and Economics 499.80 will not be allowed.

Economics 493 **3 units; H(3-0)**

Empirical Energy Economics
Students will study and learn how to apply methods of data analysis that are particularly useful in the context of energy economics.

Prerequisite(s): Economics 357, 395 and 427.

Economics 495 **3 units; H(3-0)**

Econometrics I
Introduction to the techniques used in quantifying economic relationships. Econometric principles of estimation and hypothesis testing will be applied to the various economic models. The use of a standard econometric software package is emphasized.

Prerequisite(s): Economics 301 and 303 and 395; and Mathematics 249 or 251 or 265 or 281.

Antirequisite(s): Credit for Economics 495 and 419 will not be allowed.

Economics 497 **3 units; H(3-0)**

Econometrics II
A more in-depth theoretical and empirical treatment of econometrics. Topics include: time series analysis, limited dependent variable estimation and simultaneous equation estimation.

Prerequisite(s): Economics 357, 359, 495 and Mathematics 211.

Economics 499 **3 units; H(3-0)**

Selected Topics in Economics II
A decimalized course in which topics will vary from year to year. Consult the timetable or the Department for the topics available in a given year.

Prerequisite(s): One of Economics 301, 303, 357 or 359.

MAY BE REPEATED FOR CREDIT

Economics 527 **3 units; H(3-0)**

World Oil Economics
Analysis of the world oil industry in the post-war period.

Prerequisite(s): Economics 301 and 303.

Economics 537 **3 units; H(3-0)**

Economic Growth
This is an advanced course in Macroeconomics which explores why some countries are rich and others are poor.

Prerequisite(s): Economics 359.

Corequisite(s): Prerequisite or Corequisite: Economics 357.

Economics 541 **3 units; H(3-0)**

Monetary Theory
A survey of recent work in monetary theory with primary emphasis on financial issues.

Prerequisite(s): Economics 303 and 341.

Corequisite(s): Prerequisite or Corequisite: Economics 395.

Economics 557 **3 units; H(3-0)**

Topics in Economic Theory I
Topics in microeconomic theory such as welfare economics and general equilibrium theory.

Prerequisite(s): Economics 357 and 389.

Economics 559 **3 units; H(3-0)**

Topics in Economic Theory II
Topics in macroeconomic theory such as consumption and growth.

Prerequisite(s): Economics 359 and 389 and 395.

Economics 571 **3 units; H(3-0)**

Competition Policy
The law and economics of competition policy. An examination of the economics, jurisprudence and history of competition policy towards mergers, price fixing, vertical restraints, and monopolization, primarily in Canada and the United States.

Prerequisite(s): Economics 471.

Economics 599 **3 units; H(3-0)**

Selected Topics in Economics III
A decimalized course in which topics will vary from year to year. Consult the timetable or the Department for the topics available in a given year.

Prerequisite(s): Economics 357 and 359.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Economics 605 **3 units; H(3-0)**

Computational Optimization and Economic Applications
Explores the theory and numerical implementation of mathematical programming, covering basic classes of optimization problems — linear programming, non-linear programming and complementarity problems — as ways to operationalize models of individual choice and decentralized equilibrium behaviour from economics. Applications will vary.

Economics 609 **3 units; H(3-0)**

Political Economy
Provides a selective overview of modern political economy. Gives an introduction to the basic theoretical models, empirical methodologies, and substantive findings in political economy. Covers theoretical and empirical research and the links between the two. Also treats a number of selected topics on the research frontier.

Economics 611 **3 units; H(3-0)**

Special Topics in Economics
Topics will vary from year to year. Consult the timetable or the Department for the topics available in a given year.

MAY BE REPEATED FOR CREDIT

Economics 615 **3 units; H(3-0)**

Econometrics I
Provides a foundation of econometric theory relevant for empirical work in economics. Surveys theory and applies methods of analysis developed for micro data. Taking economic models as given,

students learn how to estimate a general class of parametric models or semiparametric models, and how to conduct testing and inference given the data. Presents classical estimation and inference procedures, including linear regression, linear instrumental variables and nonlinear estimation methods.

Economics 619 **3 units; H(3-0)**

Empirical International Trade
Examines issues from the economic literature on international trade. Focuses on quantitative and empirical analysis. Specific topics include the factor content of trade, firm level and multinational behaviour, empirical testing of political economy determinants of protection, and assessing the environmental impact of trade agreements.

Economics 621 **3 units; H(3-0)**

International Trade
Focuses on the microeconomic aspects of international economics with emphasis on general equilibrium models commonly employed in international economics. Specific topics covered include theories of international specialization and exchange, trade policy and economic welfare, international factor movement, trade and growth, under both perfect competition and imperfect competition, and selected problems of trade policy in the international trading system.

Economics 627 **3 units; H(3-0)**

Energy Economics
Applies the tools of microeconomics, institutional economics, and econometrics to energy markets and policies. Focuses on empirical studies of the energy business including markets for natural gas, crude oil, gasoline, electricity and coal.

Economics 633 **3 units; H(3-0)**

Labour Economics
Emphasizes empirical implementation of theoretical models through the use of data and econometrics. Topics include labor supply theory, search theory, wage determination theories, and numerical methods for the estimation of dynamic models.

Economics 635 **3 units; H(3-0)**

Regulatory Economics
An in-depth study of regulatory economics, defined as price and entry regulation. Price and entry regulation occurs when the state restricts who can provide services and approves the terms of service. A considerable part of the course will address regulatory restructuring in network industries, with case studies on electricity reform, local telecommunications, and pipelines.

Economics 641 **3 units; H(3-0)**

Financial Economics
A review of the main themes of financial economics and an introduction of a number of frontier ideas that have marked the recent evolution of the discipline. The main focus is on asset pricing and the application of financial econometrics to modelling and prediction of financial data.

Economics 649 **3 units; H(3-0)**

Empirical Public Economics
Focuses on empirical research on the economics of the public sector, including material on taxation, public expenditures and social insurance. Gives a broad overview of this growing field and prepares for research in public economics.

Antirequisite(s): Credit for Economics 649 and 611.48 will not be allowed.

Economics 651 **3 units; H(3-0)**

Redistribution and Social Insurance
A focus on the economics of public expenditure programs designed to redistribute income or to provide social insurance against risks faced by households.

Economics 653 **3 units; H(3-0)**

Public Revenue Analysis
A focus on the revenue side of public finance, primarily in the form of taxation. The equity and efficiency aspects of different taxes are considered, as is optimal tax design. Possible topics include the taxation of labour and capital, the impact taxation on savings and risk taking, and environmental and resource taxation.

Economics 655 **3 units; H(3-0)**

Cost/Benefit Analysis
Theoretical and applied aspects of the use of cost-benefit techniques and applied welfare analysis in the evaluation of investment projects and public policies.

Economics 657 **3 units; H(3-0)**

Microeconomic Theory
Introduction to advanced microeconomic theory. Topics include consumer theory, theory of the firm, general equilibrium, uncertainty, game theory, and informational economics.

Prerequisite(s): Admission to the Master of Arts Economics program.

Note: Students in other departments can take this course with permission of the Department of Economics.

Economics 659 **3 units; H(3-0)**

Macroeconomic Theory
Introduction to the analysis of macroeconomics at an advanced level. Provides an overview of theories addressing the major questions of macroeconomic phenomena. Some coverage of applied topics, such as economic growth and government policy.

Prerequisite(s): Admission to the Master of Arts Economics program.

Note: Students in other departments can take this course with permission of the Department of Economics.

Economics 661 **3 units; H(3-0)**

Behavioural Economics
Survey of research incorporating psychological evidence into economics. Topics include fairness, altruism, prospect theory, self-control, biases in probabilistic judgment, mental accounting, and the relationship between markets, incentives, and attention and various cognitive processes.

Economics 667 **3 units; H(3-0)**

Industrial Organization
A focus on market power: its acquisition, maintenance, and exercise. Both theory and application, with an emphasis on how industrial organization does, and should, inform competition policy and antitrust law, will be examined.

Economics 669 **3 units; H(3-0)**

Empirical Industrial Organization
Firm behaviour in oligopolistic markets, as well as consumer and firm behaviour in environments with asymmetric information. Strong emphasis on combining economic models with econometric techniques to answer economic questions. Models of demand and supply, discrete static and dynamic games, production function estimation, single agent dynamic models and matching models.

Antirequisite(s): Credit for Economics 669 and 611.71 will not be allowed.

Economics 675 **3 units; H(3-0)**

Natural Resource Economics
Examines economic models of the structure and nature of natural resource industries and their interaction with the rest of the economy. Includes non-renewable and renewable resources and applies methods from capital theory, growth theory, public economics, and industrial organization to the study of natural resources.

Economics 677 **3 units; H(3-0)**

Environmental Economics
Environmental economics describes the ways in which people interact with their natural environment and the policies that best achieve society's goals in this context. Topics vary from year to year and may include benefit-cost analysis, non-market valuation, choice of policy instruments, environmental taxation, trade growth and the environment, global warming and international environmental treaties.

Economics 679 **3 units; H(3-0)**
(Community Health Sciences 661)

Health Economics
An overview of topics in health economics. An introduction to economic principles and techniques used in analysing and planning health policy, in particular the delivery of health services, and for understanding the health behaviour of individuals.

Economics 691 **1.5 units; Q(3-0)**

Research Methods I
Survey of research methods in economics. For course-based MA students.

Economics 693 **1.5 units; Q(3-0)**

Research Methods II
Survey of research methods in economics. For course-based MA students.

Economics 695 **3 units; H(3-0)**

Research Methods III
Master's research project. Identify an interesting and feasible research question, carry out an extensive literature review of the problem area, develop an economic/econometric model to address the problem, identify and collect appropriate data for empirical research.

Prerequisite(s): Admission into the Master of Arts Economics (course-based) program.

Antirequisite(s): Credit for Economics 695 and 611.55 will not be allowed.

Economics 697 **3 units; H(3-0)**

Research Methods IV
Master's research project. Continuing from Research Methods III, the economic/econometric model is fully developed with specific attention to identification issues and testable hypotheses. Appropriate econometric analyses, validation and testing are carried out, leading to a research paper reporting the problem, the model and the results.

Prerequisite(s): Admission into the Master of Arts Economics (course-based) program.

Antirequisite(s): Credit for Economics 697 and 611.57 will not be allowed.

Economics 707 **3 units; H(3-0)**

Advanced Microeconomic Theory I
Introduction to advanced microeconomic theory. Topics include consumer theory, theory of the firm, and general equilibrium.

Economics 709 **3 units; H(3-0)**

Advanced Macroeconomic Theory I
Introduction to the basic structure of the dynamic general equilibrium framework that forms the backbone of most modern macroeconomics research. Selected topics include growth, business cycles, and monetary and labor economics.

Economics 711 **3 units; H(3-0)**

Independent Study
MAY BE REPEATED FOR CREDIT

Economics 715 **3 units; H(3-0)**

Econometrics II
Selected topics in applied econometrics geared at developing econometrics techniques needed to approach empirical problems in microeconomics. The focus is on understanding how data, econometric methodology and assumptions combine to address an economic question. An emphasis is placed on understanding the validity and critical role of assumptions. Covers econometric methods for linear and non-linear models using both cross-section and panel data.

Economics 717 **3 units; H(3-0)**

Advanced Topics in Econometrics
Studies cutting edge econometric tools used to evaluate the impacts of policies, extrapolate their effects to new environments, and predict the effects of policies that have never been tried. Methods from both the structural and treatment effect paradigms of policy evaluation will be considered

Prerequisite(s): Economics 615.

Economics 723 **3 units; H(3S-0)**

Trade, Growth and the Environment I
Covers relevant theoretical work on the environmental consequences of trade liberalization and economic growth, and the relationship between resource use and globalization, focusing on newly published research. Participants are expected to present and discuss research. The specific choice of topics will be made based on research interests of the class.

Antirequisite(s): Credit for Economics 723 and 611.10 will not be allowed.

Economics 725 **3 units; H(3S-0)**

Trade, Growth and the Environment II
Covers relevant empirical work on the environmental consequences of trade liberalization and economic growth, and the relationship between resource use and globalization, focusing on newly published research. Participants are expected to present and discuss research. The specific choice of topics will be made based on research interests of the class.

Economics 757 **3 units; H(3-0)**

Advanced Microeconomic Theory II
Building on Economics 707, a comprehensive treatment of game theory, the economics of uncertainty and information, and the theory of incentives will be introduced. Other topics may be included as time and interest allow.

Prerequisite(s): Economics 707.

Economics 759 **3 units; H(3-0)**

Advanced Macroeconomic Theory II
Building on Economics 709, a survey of the ideas, controversies, and techniques that constitute modern macroeconomics. The principal issues it covers lie at the heart monetary and fiscal policy and of such important social problems as business cycles and unemployment. The empirical study of key issues raised in theoretical and political debates is also emphasized.

Prerequisite(s): Economics 709.

Economics 791 **1.5 units; Q(1.5-0)**

PhD Research Workshop
Survey of research methods in economics.

Prerequisite(s): Admission to the PhD program in Economics.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Education EDUC

Additional graduate education courses are offered under the course headings Educational Psychology (EDPS) and Educational Research (EDER).

Instruction offered by members of the Werklund School of Education and by others.

Junior Courses

Education 201 **3 units; H(3-0)**

Introduction to Educational Studies
An introduction to the breadth and complexity of educational studies. Unique among academic domains, educational studies not only arises in the intersections of many other fields – including psychology, sociology, anthropology, and a range of disciplinary domains – it must also be responsive to a rapidly changing world.

Note: It is required that all concurrent students complete Education 201 prior to entering the third year of the concurrent program. Concurrent students who have not completed Education 201 cannot progress to Semester 1 of the BEd program.

Senior Courses

Education 420 **3 units; H(3-0)**
(formerly Education 401)

Issues in Learning and Teaching
Presents an overview of the central issues related to the nature of learning and teaching for those preparing for the teaching profession. Themes include: the nature of learning; current realities in society; patterns of growth and development; and the changing dynamics of the teaching profession.

Education 427 **3 units; H(3S-0)**

Science, Technology, Engineering and Mathematics (STEM)
An introduction to key elements of STEM Education, including curriculum, pedagogy, standards and assessment. Participants will learn how to engage students and integrate STEM topics across all subject areas.

427.01 Early Childhood Education

427.02 Elementary Specialization

427.03 Secondary Specialization

427.04 K-12

Prerequisite(s): Must be registered in the corresponding program as their teachable subject area.

Corequisite(s): Education 440.

Education 430 **3 units; H(3S-0)**
(formerly Education 403)

Pragmatics of Learning and Teaching
Examines the concomitant requirements within which teachers operate. The major components that will be addressed include the ways in which teachers work within the parameters of prescribed curricula and assessment requirements, follow system and school policies, participate in team teaching and school culture, and reflect one's work, values and goals.

Corequisite(s): Education 440.

Education 435 **3 units; H(3S-0)**
(formerly Education 404)

Literacy, Language and Culture
The orienting principle is that every teacher is a teacher of reading. Includes a focus on the necessity for teachers across all disciplines and grades to attend to dimensions of language development, linguistic diversity, and literacy learning in their classrooms.

Education 440 **3 units; H(0-3)**
(formerly Education 405)

Field Experience I
Students will participate in Educational Rounds in school settings within and outside of their areas of specializations under the guidance of their university field instructor and the partner school leadership team. They will explore the organization of learning in the school and the perspective of the learner and the teacher.

NOT INCLUDED IN GPA

Education 445 **3 units; H(2-1)**
(formerly Education 406)

Individual Learning: Theories and Applications
Covers contemporary theories regarding the nature of individual learning. Students will examine the ways educators guide and support learning, design effective learning experiences, and understand underpinning factors related to individual learning. The application of these theories will be examined using examples that demonstrate and exemplify individual learning.

Prerequisite(s): Education 420, 427, 430, and 435.

Education 450 **3 units; H(3S-0)**
(formerly Education 407)

Diversity in Learning
Includes key topics in inclusive education from an interdisciplinary perspective. The development and conception of diversity of learning will be examined from historical and contemporary perspectives. Building upon this foundation, students will consider the multiple and contested ways in which diversity of learning has been conceived, implemented and evaluated in schools.

Prerequisite(s): Education 420, 427, 430, and 435.

Education 456 **3 units; H(3S-0)**
(formerly Education 555)

Assessment
An array of topics related to assessment to help students develop a professional level of knowledge, skills and attitudes in relation to the philosophy, theory and pedagogical application of assessment practices for K-12 education.

Prerequisite(s): Education 420, 427, 430, and 435.

Antirequisite(s): Credit for Education 456 and 511 will not be allowed.

Education 460 **3 units; H(3S-0)**
(formerly Education 409)

Specialization I
Introduction on enacting pedagogy in each of the teachable subject areas in the program and pedagogical content knowledge in each area. Includes disciplinary ways of knowing, doing and being; understanding the Alberta Programs of Study; designing for deep understanding of learners.

460.01 Elementary Early Childhood Education

460.02 Elementary English as an Additional Language

460.03 Elementary English Language Arts

460.04 Elementary Fine Arts

460.05 Elementary French

460.06 Elementary Inclusive Education

460.07 Elementary Mathematics

460.08 Elementary Physical Education

460.09 Elementary Science

460.10 Elementary Second Languages

460.11 Elementary Social Studies

460.12 Secondary English Language Arts

460.13 Secondary Fine Arts

460.14 Secondary French

460.15 Secondary Mathematics

460.16 Secondary Physical Education

460.17 Secondary Science

460.18 Secondary Second Languages

460.19 Secondary Social Studies

460.20 K-12 Social Studies

460.21 K-12 English Language Arts Education

460.22 K-12 Mathematics

460.23 K-12 Science

Prerequisite(s): Education 420, 427, 430, and 435 and registration in the corresponding program as their teachable subject area.

Education 465 **3 units; H(0-3)**
(formerly Education 411)

Field Experience II
This block field experience will have major focus on the complexities of individual learning. Prospective teachers will have the opportunity to follow individual students through various classrooms within their assigned schools under the guidance of their university field instructors and partner school leadership teams.

Prerequisite(s): Education 420, 427, 430, and 435.

NOT INCLUDED IN GPA

Education 520 **3 units; H(3S-0)**
(formerly Education 502)

Interdisciplinary Learning
Students will be introduced to new knowledge building experiences that deepen their understanding of the interdisciplinary nature of learning and practice in schools and societies. Particular attention will address how teachers integrate ideas to connect learning and knowledge between subject specializations in attending to complex forms of learning and understanding, and how teachers understand their agency and leadership roles in concert with the responsibility that accompanies it.

Prerequisite(s): Education 445, 450, 456 or 455, 460 and 465.

Education 525 **3 units; H(3-0)**
(formerly Education 503)

Ethics and Law in Education
An introduction to the historical genesis and institutional structure of Alberta's system of education; an understanding of its legal underpinnings; an opportunity for dialogue; on current major issues in education; and discussion involving ethical decision-making surrounding educational issues.

Prerequisite(s): Education 445, 450, 456 or 455, 460 and 465.

Education 530 **3 units; H(3S-0)**
(formerly Education 505)

FNMI History, Education and Leadership
Students will be introduced to the national and international experiences and advances of Indigenous peoples as related to education. Particular attention will be given to understanding the histories and diversity of the First Nations, Métis and Inuit peoples of Canada and the concomitant implications that this has for education policy and practice.

Prerequisite(s): Education 445, 450, 456 or 455, 460 and 465.

Education 535 **3 units; H(3S-0)**
(formerly Education 506)

Specialization II
Deepens students' knowledge on enacting pedagogy in each of the specialization in the program and their pedagogical content knowledge in each specialization.

535.01 Elementary Early Childhood Education Specialization

535.02 Elementary English as an Additional Language Specialization

535.03 Elementary English Language Arts Specialization

535.04 Elementary Fine Arts Specialization

535.05 Elementary French Specialization

535.06 Elementary Inclusive Education Specialization

535.07 Elementary Mathematics Specialization

535.08 Elementary Physical Education Specialization

535.09 Elementary Science Specialization

535.10 Elementary Second Languages Specialization

535.11 Elementary Social Studies Specialization

535.12 Secondary English Language Arts Specialization

535.13 Secondary Fine Arts Specialization

535.14 Secondary French Specialization

535.15 Secondary Mathematics Specialization

535.16 Secondary Physical Education Specialization

535.17 Secondary Science Specialization

535.18 Secondary Second Languages Specialization

535.19 Secondary Social Studies Specialization

Prerequisite(s): Education 445, 450, 456 or 455, 460, 465 and registration in the corresponding program.

Education 540 **3 units; H(0-3)**
(formerly Education 508)

Field Experience III
This team-oriented block practicum is founded upon the principles of collaborative learning. It includes structures and supports that promote positive interdependence, individual accountability, equal participation, and simultaneous interaction.

Prerequisite(s): Education 445, 450, 456, 460 and 465.

NOT INCLUDED IN GPA

Education 545 **3 units; H(3S-0)**
(formerly Education 509)

Elementary/Secondary Curriculum I
Within the overarching discipline of science, the major themes of environment, sustainability, and health and wellness will be examined through inquiry-based cases. Critical examination of science literacy and authentic science, particularly ethical, practical, and political dimensions. To reflect the role of science education in the 21st century globalized society.

545.01 Early Childhood Education

545.02 Elementary Route

545.03 Secondary Route

Prerequisite(s): Education 520, 525, 530, 535, and 540 and registration in the corresponding program.

Education 550 **3 units; H(3S-0)**
(formerly Education 510)

Elementary/Secondary Curriculum II
Further develops the enactment of pedagogy in the core elementary and secondary school curriculum disciplines.

550.01 Early Childhood Education

550.02 Elementary Route

550.03 Secondary Route

Prerequisite(s): Education 520, 525, 530, 535, and 540 and registration in the corresponding program.

Education 556 **3 units; H(3S-0)**
(formerly Education 455)

Professional Development and Lifelong Learning
Focuses on adult education perspectives on lifelong learning and the teaching profession. It emphasizes how novice teachers understand and encourage their learning, and the impacts of that learning on their teaching practice. Theoretical frameworks, philosophical underpinnings and reflections on experiences of adult learning will be explored.

556.01 Early Childhood Education

556.02 Elementary Route

556.03 Secondary Route

Prerequisite(s): Education 520, 525, 530, 535 and 540 and registration in the corresponding program.

Antirequisite(s): Credit for Education 556 and 408 will not be allowed.

Education 560 **6 units; F(0-6)**
(formerly Education 513)

Field Experience IV
In this extended block field experience, students will have an opportunity to work one-on-one to lead a class with a mentor teacher. They will be under the guidance of their university advisors and partner school leadership teams.

Prerequisite(s): Education 520, 525, 530, 535, and 540.

NOT INCLUDED IN GPA

Education 570 **6 units; F(0-6)**

Field Experience for Certification
Students will participate in an extended block field experience to lead a class with a mentor teacher.

Students will be supervised by their University field instructors and partner teachers.

Note: Restricted to students who require Alberta provincial certification or students who have received permission to register from the Associate Dean.

NOT INCLUDED IN GPA

Educational Psychology EDPS

Instruction is offered by members of Graduate Programs in Education.

Notes:

Additional graduate education courses are offered under the course headings Educational Research (EDER) and undergraduate courses are offered under the course heading Education (EDUC).

Only Psychology courses may be used to fulfill the requirements for the Major or Minor in Psychology.

Graduate Courses

Note: Graduate courses within Graduate Programs in Education: Educational Psychology can be taken only with consent of Graduate Programs in Education, and in specific cases additional requirements may be necessary (see below).

Educational Psychology 602 3 units; H(3S-0)

Counselling Theories and Professional Practice
Engages students in a critical evaluation of a range of contemporary counselling theories and helps them begin to develop a description of their own emerging theory.

Antirequisite(s): Credit for Educational Psychology 602 and either Applied Psychology 602 or Campus Alberta Applied Psychology 601 will not be allowed.

Educational Psychology 604 3 units; H(3-0)

Professional Ethics in Applied Psychology
Ethical, legal and professional knowledge to inform practice in educational, counselling and mental health contexts.

Antirequisite(s): Credit for Educational Psychology 604 and either Educational Psychology 603 or Campus Alberta Applied Psychology 603 will not be allowed.

Educational Psychology 606 3 units; H(3S-0)

Methods of Inquiry in Professional Practice
Helps students critically analyze other research efforts and in the process learn how to think through their own research questions in a critically evaluative manner.

Antirequisite(s): Credit for Educational Psychology 606 and Applied Psychology 606 will not be allowed.

Educational Psychology 608 3 units; H(3S-0)

Introduction to Statistical Analyses
An introductory course on descriptive and inferential statistics designed to give students with minimal statistical background sufficient competence to conduct basic statistical procedures. Topics will include: displaying data; measures of central tendency, variability, and correlation; regression analysis and prediction; probability; parameter estimation; and analysis of variance. Emphasis will be on understanding basic concepts, using software to conduct analyses, and interpretation of results.

Antirequisite(s): Credit for Educational Psychology 608 and either Applied Psychology 608 or Campus Alberta Applied Psychology 608 will not be allowed.

Educational Psychology 609 3 units; H(3-2)

Research Design in Statistics II
Research design and statistics, including methods for research in psychology and related laboratory instruction.

Antirequisite(s): Credit for Educational Psychology 609 and either Educational Psychology 605 or Applied Psychology 605 will not be allowed.

Educational Psychology 610 3 units; H(3-0)

Research Methodology in Counselling
Survey course on research methodologies in counselling, which addresses issues of research design, methods and interpretation of research findings.

Antirequisite(s): Credit for Educational Psychology 610 and any of Applied Psychology 605 or Educational Psychology 605 or Campus Alberta Applied Psychology 617 will not be allowed.

Educational Psychology 611 3 units; H(3-2)

Qualitative Research Methodologies
Advanced study of qualitative research methods for use in applied psychology and education.

Antirequisite(s): Credit for Educational Psychology 611 and Applied Psychology 611 will not be allowed.

Educational Psychology 612 3 units; H(3-0)

Research Methods in School Psychology
Advanced study of qualitative research methods for use in applied psychology and education.

Antirequisite(s): Credit for Educational Psychology 612 and either Applied Psychology 605 or Educational Psychology 605 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 614 3 units; H(3-0)

Ethics in Professional Psychology
Engages students in ethical and legal issues in psychology, and professional issues in practice settings.

Antirequisite(s): Credit for Educational Psychology 614 and either Psychology 603 or Applied Educational Psychology 603 will not be allowed.

Educational Psychology 615 3 units; H(3-0)

Theoretical and Clinical Foundations of Assessment
In-depth review of theoretical and clinical foundations of psycho-educational assessment. Focus is on processes of assessment, properties of tests, use and interpretation of tests and clinical diagnosis.

Antirequisite(s): Credit for Educational Psychology 615 and Applied Psychology 615 will not be allowed.

Educational Psychology 616 3 units; H(3S-0)

Assessment Theory and Practices
Combines a theoretical and practical focus to develop a framework from which to approach the assessment of client change in a variety of contexts.

Prerequisite(s): Educational Psychology 602 and 622 or equivalents.

Antirequisite(s): Credit for Educational Psychology 616 and either Applied Psychology 616 or Campus Alberta Applied Psychology 613 will not be allowed.

Educational Psychology 617 3 units; H(3-3)

Psychological Assessment of Adults
Provides students with the knowledge and skills necessary to select, administer, score and interpret formal psychological tests and other assessment instruments commonly used within counselling contexts.

Prerequisite(s): Educational Psychology 615 or equivalent.

Antirequisite(s): Credit for Educational Psychology 617 and Applied Psychology 617 will not be allowed.

Educational Psychology 618 3 units; H(3-2)

Multivariate Design and Analysis
Research design and statistics in psychology, with special reference to large sample techniques.

Prerequisite(s): Educational Psychology 609 or consent of the instructor.

Antirequisite(s): Credit for Educational Psychology 618 and either Educational Psychology 607 or Applied Psychology 607 will not be allowed.

Educational Psychology 619 3 units; H(3-0)

Counselling Girls and Women
Sex role development; stereotyping and social roles; counselling theories; counselling approaches.

Antirequisite(s): Credit for Educational Psychology 619 and Applied Psychology 619 will not be allowed.

Educational Psychology 621 3 units; H(2-2)

Creating a Working Alliance
Theory and practice in developing skills contributing to working alliance and problem clarification. Ethical, legal and professional issues are the context for the application of generic counselling skills in laboratory experiences.

Prerequisite(s): Applied Psychology 419 or equivalent or consent of Graduate Programs in Education.

Corequisite(s): Prerequisite or Corequisite: Educational Psychology 623 or equivalent.

Antirequisite(s): Credit for Educational Psychology 621 and Applied Psychology 621 will not be allowed.

Note: Not open to Open Studies students.

Educational Psychology 622 3 units; H(3S-0)

Developing and Sustaining a Working Alliance with Clients
Focuses on the understanding and acquisition of skills that are essential for the development of working alliances in counselling contexts. Introduces a theoretical framework for the application of counselling skills in addition to providing the opportunity for skill practice.

Corequisite(s): Prerequisite or Corequisite: Educational Psychology 602 or equivalent.

Antirequisite(s): Credit for Educational Psychology 622 and either Applied Psychology 622 or Campus Alberta Applied Psychology 605 will not be allowed.

Educational Psychology 623 3 units; H(3-0)

Theory in Counselling
History and systems involved in counselling psychology and client change.

Antirequisite(s): Credit for Educational Psychology 623 and Applied Psychology 623 will not be allowed.

Educational Psychology 624 3 units; H(3-0)

Cultural and Social Justice Issues in Professional Practice
A critical examination of cultural and equity issues related to the lives of clients and the psychological professionals serving them.

Antirequisite(s): Credit for Educational Psychology 624 and any of Applied Psychology 625, Educational Psychology 625 or Campus Alberta Applied Psychology 607 will not be allowed.

Educational Psychology 625 3 units; H(3-0)

Cultural Influences on Professional Practice
An examination of cultural influences on theory and practice in applied psychology.

Antirequisite(s): Credit for Educational Psychology 625 and Applied Psychology 625 will not be allowed.

Educational Psychology 626 3 units; H(3-0)

Group Interventions and Processes
Examines theoretical, research, experiential knowledge helpful in facilitating diverse educational and psychological groups.

Antirequisite(s): Credit for Educational Psychology 626 and any of Applied Psychology 627 or Educational Psychology 627 or Campus Alberta Applied Psychology 637 will not be allowed.

Educational Psychology 627 3 units; H(3-1)

Group Processes in Applied Psychology
Theory of group practice in applied psychology, with experiential laboratory.

Antirequisite(s): Credit for Educational Psychology 627 and either Educational Psychology 626 or Applied Psychology 627 will not be allowed.

Educational Psychology 629 3 units; H(3S-2)

Theory and Applications: Selected Topics
Antirequisite(s): Credit for Educational Psychology 629 and Applied Psychology 629 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 630 3 units; H(3-0)

Foundations of Career Counselling
Review and application of theoretical and research literatures relevant to counselling clients with career concerns.

Antirequisite(s): Credit for Educational Psychology 630 and any of Applied Psychology 631, Educational Psychology 631 or Campus Alberta Applied Psychology 621 will not be allowed.

Educational Psychology 631 3 units; H(3-0)

Theories of Career Development
Study of career development theory and related research; implications for the applied field.

Antirequisite(s): Credit for Educational Psychology 631 and either Educational Psychology 630 and Applied Psychology 631 will not be allowed.

Educational Psychology 632 3 units; H(3S-0)

Career Development and Services for Organizational Settings
Designed to combine theoretical and practical concerns regarding applications of career development concepts to human resources contexts in organizations. Concepts will be relevant to counselling and human resources development professionals.

Prerequisite(s): Educational Psychology 602, 603, 622 and 625

Antirequisite(s): Credit for Educational Psychology 632 and either Applied Psychology 632 or Campus Alberta Applied Psychology 627 will not be allowed.

Educational Psychology 633 3 units; H(2-2)

Career Counselling
Laboratory and field experiences in career counselling.

Prerequisite(s): Educational Psychology 631.

Antirequisite(s): Credit for Educational Psychology 633 and either Applied Psychology 633 or Campus Alberta Applied Psychology 623 will not be allowed.

Educational Psychology 634 3 units; H(3S-0)

Multicultural Career Development and Counselling
Increasing cultural diversity requires career development practitioners to examine the ways that their services are designed and delivered. Designed to enable students to deliver culturally responsive career counselling services to diverse populations.

Prerequisite(s): Educational Psychology 636 and 646 or equivalent.

Antirequisite(s): Credit for Educational Psychology 634 and either Applied Psychology 634 or Campus Alberta Applied Psychology 629 will not be allowed.

Educational Psychology 635 3 units; H(3-0)

Advanced History, Theory, and Practice in Psychology
Course examines the history of psychological concepts in Western culture, major theoretical systems and research approaches, and the foundational assumptions of contemporary perspectives in psychology.

Antirequisite(s): Credit for Educational Psychology 635 and Applied Psychology 635 will not be allowed.

Note: Open to students in Psychology and Educational Research programs.

Educational Psychology 636 3 units; H(3S-0)

Systemic Approaches to Community Change
Provides students with a theoretical and practical basis to work as effective community change agents in a broad range of sectors. An examination of comprehensive guidance in schools provides a foundation for exploring key concepts pertinent to developing and implementing comprehensive services in a variety of contexts, and in the process, gaining a better understanding of communities, and building their strengths and capacities.

Antirequisite(s): Credit for Educational Psychology 636 and either Applied Psychology 636 or Campus Alberta Applied Psychology 625 will not be allowed.

Educational Psychology 637 3 units; H(3-0)

Relationship Counselling
Review of theory and systems in marriage and family counselling. Structured observation activities.

Corequisite(s): Prerequisite or Corequisite: Educational Psychology 640 or consent of Graduate Programs in Education.

Antirequisite(s): Credit for Educational Psychology 637 and Applied Psychology 637 will not be allowed.

Educational Psychology 638 3 units; H(3S-0)

Counselling Interventions for Client Change
Combines a theoretical and practical focus to develop a framework from which to plan and implement client change interventions in a variety of contexts.

Prerequisite(s): Educational Psychology 602 and 622 or equivalents.

Antirequisite(s): Credit for Educational Psychology 638 and either Applied Psychology 638 or Campus Alberta Applied Psychology 615 will not be allowed.

Educational Psychology 639 3 units; H(2-2)

Counselling Interventions
Theory and practice in planning and implementing client change interventions; the application of counselling interventions in laboratory experiences.

Prerequisite(s): Educational Psychology 621 and 623 or equivalents or consent of Graduate Programs in Education.

Antirequisite(s): Credit for Educational Psychology 639 and Applied Psychology 639 will not be allowed.

NOT INCLUDED IN GPA

Educational Psychology 640 6 units; F(2-7)

Practicum in Counselling Psychology
Supervised counselling experience and related seminars.

Prerequisite(s): Educational Psychology 621, 623, 625 or equivalents or consent of Graduate Programs in Education.

Corequisite(s): Prerequisites or Corequisites: Educational Psychology 614, 615, 639 and 695, or equivalent.

Antirequisite(s): Credit for Educational Psychology 640 and Applied Psychology 640 will not be allowed.

Note: Not open to Open Studies students.

NOT INCLUDED IN GPA

Educational Psychology 641 3 units; H(3-0)

Development, Learning and Cognition - Child and Adolescent
The interactions of development, learning and cognition in childhood and adolescence.

Antirequisite(s): Credit for Educational Psychology 641 and Applied Psychology 641 will not be allowed.

Educational Psychology 642 3 units; H(3S-0)

Counselling Practicum I
Provides an opportunity for professional development and supervised practice in a general counselling setting. Students will be involved in direct work

with clients under the supervision of a qualified professional.

Prerequisite(s): Educational Psychology 602, 604, 616, 622, 624, and 638.

Antirequisite(s): Credit for Educational Psychology 642 and either Applied Psychology 642 or Campus Alberta Applied Psychology 611 will not be allowed.

NOT INCLUDED IN GPA

Educational Psychology 643 3 units; H(3-0)

Development, Learning and Cognition - Adult
The interactions of development, learning and cognition in childhood and adulthood.

Antirequisite(s): Credit for Educational Psychology 643 and Applied Psychology 643 will not be allowed.

Educational Psychology 644 3 units; H(3S-0)

Counselling Practicum II
Provides an opportunity for professional development and supervised practice in a specialized counselling context. Students will be involved in direct work with clients under the supervision of a qualified professional. The practicum allows students to actively explore issues encountered in working with a specialized client population or area of practice.

Prerequisite(s): Educational Psychology 616, 638 and 642 or equivalents.

Antirequisite(s): Credit for Educational Psychology 644 and either Applied Psychology 644 or Campus Alberta Applied Psychology 619 will not be allowed.

NOT INCLUDED IN GPA

Educational Psychology 646 3 units; H(3S-0)

Processes of Learning
Addresses the essential features of major theories of learning and presents current research in each area of learning. Students will discover how the principles of learning relate to their own learning and behaviour, and how the principles can be used to understand the behaviour of others and enhance counselling practice.

Antirequisite(s): Credit for Educational Psychology 646 and either Applied Psychology 646 or Campus Alberta Applied Psychology 631 will not be allowed.

Educational Psychology 648 3 units; H(3S-0)

Lifespan Human Development
Introduces a comprehensive view of human development across the lifespan, drawing on the major theoretical positions. Developmental themes are discussed in terms of their application to typical and atypical human development in children, adolescents and adults.

Antirequisite(s): Credit for Educational Psychology 648 and either Applied Psychology 648 or Campus Alberta Applied Psychology 633 will not be allowed.

Educational Psychology 650 3 units; H(3-0)

Family and Social Bases of Behaviour
Course explores theoretical perspectives and contemporary research on socialization processes in childhood and adolescence, with particular emphasis on family and peer interpersonal relations.

Antirequisite(s): Credit for Educational Psychology 650 and Applied Psychology 650 will not be allowed.

Educational Psychology 651 3 units; H(3-0)

Disorders of Learning and Behaviour
Focuses on childhood and adolescent disorders through an examination of theories, diagnostic and associated features and disorders, prevalence, developmental course, cultural and gender context, and familial patterns.

Antirequisite(s): Credit for Educational Psychology 651 and Applied Psychology 651 will not be allowed.

Note: Open to students in Educational Psychology programs or consent of Graduate Programs in Education.

Educational Psychology 652 3 units; H(3-0)

Academic and Language Assessment
Course provides a broad understanding of the standards that guide assessment practices through an examination of assessment of academic areas and language skills.

Antirequisite(s): Credit for Educational Psychology 652 and either Educational Psychology 667 or Applied Psychology 652 will not be allowed.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 653 3 units; H(3-0)

Professional Practice of School Psychology
A focus on the preparation, roles, functions, and employment of school psychologists as well as the regulation, evaluation, and accountability of school psychologists.

Note: Open to students in Educational Psychology programs or consent of Graduate Programs in Education.

Educational Psychology 654 3 units; H(3-0)

Neurobiological and Developmental Bases of Learning and Behaviour
Examines the educational relevance of the fields of neuroscience and school neuropsychology in the context of school-based service delivery. A survey of the extant literature and methods regarding best practices in neuropsychological assessment, case conceptualization, and evidence-based intervention for children with and without neurodevelopmental disabilities.

Antirequisite(s): Credit for Educational Psychology 654 and Applied Psychology 654 will not be allowed.

Note: Open to students in Educational Psychology programs or consent of Graduate Programs in Education.

Educational Psychology 655 3 units; H(3-0)

Advanced Child Development
Explores the theory and research supporting recent advances in select areas of child development. Topics include: parent/peer relations; personality, self and self-concept; language and thought; emotion and motivation; and pro-social, antisocial, and moral development.

Note: Open to students in Educational Psychology programs or consent of Graduate Programs in Education.

Educational Psychology 656 3 units; H(1-14)

Practicum in Academic and Language Assessment and Intervention
This 200-hour practicum provides opportunities to develop competencies in academic and language assessment and interventions within an approved setting.

Antirequisite(s): Credit for Educational Psychology 656 and Applied Psychology 656 will not be allowed.

Note: Open to students in Educational Psychology programs.

NOT INCLUDED IN GPA

Educational Psychology 657 3 units; H(3-0)

Cognitive and Neuropsychological Assessment
Focuses on the theory and practice of intellectual/cognitive, memory, and neuropsychological assessment primarily through the use of individually administered standardized tests.

Antirequisite(s): Credit for Educational Psychology 657 and Applied Psychology 657 will not be allowed.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 658 3 units; H(3-0)

Interventions to Promote Cognitive, Academic, and Neuropsychological Well-Being
Focuses on evidence-based interventions aimed at promoting cognitive, academic, and neuropsychological development in children and youth.

Antirequisite(s): Credit for Educational Psychology 658 and Applied Psychology 658 will not be allowed.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 659 3 units; H(3-0)

Academic Assessment and Intervention
Academic and language assessment and intervention primarily through the use of individually administered standardized tests and evidence-based interventions aimed at promoting academic and language development in children and youth.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 660 3 units; H(3-0)

Social, Emotional, and Behavioural Assessment
Grounded in bioecological systems perspective and developmental and resiliency frameworks, course focuses on the comprehensive assessment of children and youth referred for social, emotional, and behavioural concerns.

Antirequisite(s): Credit for Educational Psychology 660 and Applied Psychology 660 will not be allowed.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 661 3 units; H(3-0)

Psychological Foundations of Student Exceptionality
Major trends, developments, theoretical foundations, and current practices and challenges relative to the education of students with diverse learning needs.

Antirequisite(s): Credit for Educational Psychology 661 and Applied Psychology 661 will not be allowed.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 662 3 units; H(3-1)

School Psychology Practicum I
Provides supervised experience to develop competencies aligned with the practice of school psychology, including consultation, assessment,

and intervention. Adherence to all provincial and national ethical and professional guidelines is expected.

Prerequisite(s): Educational Psychology 659.

Note: Open to students in School and Applied Child Psychology program.

NOT INCLUDED IN GPA

Educational Psychology 663 3 units; H(3-1)

School Psychology Practicum II
Provides supervised experience to further develop and refine school psychologist competencies. Administration of evidenced–based intervention strategies will be also required. Adherence to all provincial and national ethical and professional guidelines is expected.

Prerequisite(s): Educational Psychology 665.

Note: Open to students in School and Applied Child Psychology program.

NOT INCLUDED IN GPA

Educational Psychology 664 3 units; H(3S-0)

Psychological Approaches to Health
Focuses on how human psychology and human health intersect and is organized according to core principles and skills that guide the practice of health psychology. Will orient students to contemporary theories and models of health, illness, and health promotion, and their relevance in a variety of settings.

Prerequisite(s): Educational Psychology 602, 624, and 610 or equivalents.

Antirequisite(s): Credit for Educational Psychology 664 and either Applied Psychology 664 or Campus Alberta Applied Psychology 635 will not be allowed.

Educational Psychology 665 3 units; H(3-0)

Cognitive Assessment and Intervention
The theory and practice of intellectual/cognitive, and memory assessment primarily through the use of individually administered standardized tests and evidence-based interventions aimed at promoting cognitive, academic, and neuropsychological development in children and youth.

Prerequisite(s): Educational Psychology 662.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 667 3 units; H(3-3)

Assessment of Students with Exceptional Learning Needs
Theory and practice in school-based academic and social-emotional assessment techniques and strategies for use with students with diverse learning needs. Laboratory and field experiences.

Antirequisite(s): Credit for Educational Psychology 667 and either Educational Psychology 652 or Applied Psychology 667 will not be allowed.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 668 3 units; H(3S-0)

Theory and Practice of Clinical Supervision
Intended for students to learn the process of clinical supervision and as a result become better consumers of supervision, more effective supervisors, and more able to evaluate their current and future development and involvement in supervisory roles.

Antirequisite(s): Credit for Educational Psychology 668 and either Applied Psychology 668 or Campus Alberta Applied Psychology 681 will not be allowed.

Educational Psychology 669 3 units; H(3-0)

Social-Emotional Assessment and Intervention
Focuses on the theory and practice of social, emotional, and behavioural assessment and on evidence-based interventions to enhance the mental health and behavioural well-being of children and youth.

Prerequisite(s): Educational Psychology 663.

Note: Open to students in School and Applied Child Psychology program.

Educational Psychology 670 3 units; H(3S-0)

Final Project Portfolio
Students complete a culminating independent project in their area of specialization to satisfy the degree requirements.

Prerequisite(s): Educational Psychology 602, 604, 610, 616, 622, 624, 638, and 642.

Antirequisite(s): Credit for Educational Psychology 670 and either Applied Psychology 670 or Campus Alberta Applied Psychology 693 will not be allowed.

Educational Psychology 671 3 units; H(1-3)

Practicum in School-based Interventions for Children and Youth with Exceptional Learning Needs: I
Practicum in educational interventions for children and adolescents with special learning needs. Focus on general assessment, analysis, intervention, and strategies in applied settings.

Prerequisite(s): Educational Psychology 661 or equivalent.

Antirequisite(s): Credit for Educational Psychology 671 and Applied Psychology 671 will not be allowed.

Educational Psychology 672 3 units; H(3S-0)

Counselling Exceptional Children
Intended to help students enhance their awareness and understanding of major trends, developments, theoretical foundations, and current practices and challenges in counselling and providing consultation for special needs children and adolescents.

Antirequisite(s): Credit for Educational Psychology 672 and either Applied Psychology 672 or Campus Alberta Applied Psychology 641 will not be allowed.

Educational Psychology 673 3 units; H(3-3)

Practicum in School-based Interventions for Children and Youth with Exceptional Learning Needs: II
Advanced practicum in educational interventions for children and adolescents with special learning needs. Focus on specialized assessment, analysis, interventions, and strategies in applied settings.

Prerequisite(s): Educational Psychology 671 or equivalent.

Antirequisite(s): Credit for Educational Psychology 673 and Applied Psychology 673 will not be allowed.

Educational Psychology 674 3 units; H(3-0)

Interventions to Promote Socio-emotional and Behavioural Well-Being
Focus on strategies to enhance the socio-emotional and behavioural well-being of children and youth who exhibit significant emotional and behavioural needs in school and community settings.

Prerequisite(s): Educational Psychology 660 or equivalent.

Antirequisite(s): Credit for Educational Psychology 674 and Applied Psychology 674 will not be allowed.

Educational Psychology 675 3 units; H(1-14)

Practicum in Cognitive and Neuropsychological Assessment and Intervention
This 200-hour practicum provides opportunities to develop competencies in cognitive and neuropsychological assessment and interventions within an approved setting.

Prerequisite(s): Educational Psychology 658 or equivalent.

Antirequisite(s): Credit for Educational Psychology 675 and Applied Psychology 675 will not be allowed.

NOT INCLUDED IN GPA

Educational Psychology 676 3 units; H(1-14)

Practicum in Social, Emotional, and Behavioural Assessment and Intervention
This 200-hour practicum provides opportunities to develop competencies in social, emotional, and behavioural assessment and intervention within an approved setting.

Prerequisite(s): Educational Psychology 674 or equivalent.

Antirequisite(s): Credit for Educational Psychology 676 and Applied Psychology 676 will not be allowed.

NOT INCLUDED IN GPA

Educational Psychology 677 3 units; H(3-0)

Play Therapy Theory and Process
The theoretical foundations and basic orientation necessary to understand and use play as therapy are outlined, along with the developmental underpinnings of play in children and the basic principles upon which child-centred play therapy is built.

Antirequisite(s): Credit for Educational Psychology 677 and Applied Psychology 677 will not be allowed.

Educational Psychology 678 3 units; H(3S-0)

Art Therapy History
Art therapy is examined from a broad perspective, from its beginnings as a treatment for mentally or emotionally disturbed people, to its development as a distinct profession in North America and Europe. The works of key authors are covered, along with their theoretical approaches and current trends in the field. Students will learn how the foundations of art therapy are incorporated by many disciplines, with applications in many settings.

Prerequisite(s): Educational Psychology 642, 616, and 638 or equivalents.

Antirequisite(s): Credit for Educational Psychology 678 and either Applied Psychology 678 or Campus Alberta Applied Psychology 661 will not be allowed.

Educational Psychology 679 3 units; H(3-0)

Fundamentals of Solution-Oriented Therapy
Provides a working knowledge of the theory and practice of solution-oriented therapy and related models.

Antirequisite(s): Credit for Educational Psychology 679 and Applied Psychology 679 will not be allowed.

Educational Psychology 680 3 units; H(3S-0)

Counselling Graduate Practicum: Selected Topics
Graduate Practicum: Selected Topics.

Antirequisite(s): Credit for Educational Psychology 680 and either Applied Psychology 680 or Campus Alberta Applied Psychology 695 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 682 3 units; H(3-3)

Special Topics: Counselling
Graduate Seminar: Special Topics.

Antirequisite(s): Credit for Educational Psychology 682 and either Applied Psychology 682 or Campus Alberta Applied Psychology 691 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 683 3 units; H(3-0)

Consultation in School Psychology
Examines the purpose and skills of consultation, evaluation issues, and strategies in consultation as well as the role of school psychologists relative to multidisciplinary school teams, school-based problems solving, and student development and learning.

Note: Open to students in Educational Psychology or consent of Graduate Programs in Education.

Educational Psychology 684 3 units; H(3-0)

Advanced Seminar in the Domains of School Psychology Leadership and Function in the Schools
An advanced study of the domains and functions of school and applied child psychologists. Students are required to demonstrate a comprehensive understanding of competencies in ten domains identified by the National Association of School Psychologists as central to the school psychology profession.

Antirequisite(s): Credit for Educational Psychology 684 and Applied Psychology 684 will not be allowed.

Note: Open only to students enrolled in the MEd School and Applied Child Psychology program who have completed all other course work prior to enrolment.

Educational Psychology 685 3 units; H(3-0)

Child and Adolescent Counselling
Introduces the theory and practice of counselling in school-based settings and fosters student development of rudimentary counselling and psychotherapy skills for school-based service delivery.

Note: Open to students in Educational Psychology or consent of Graduate Programs in Education.

Educational Psychology 686 3 units; H(3S-0)

Counselling Graduate Seminar: Selected Topics
Graduate Seminar: Selected Topics.

Antirequisite(s): Credit for Educational Psychology 686 and Applied Psychology 686 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 691 1.5 units; Q(1.5S-0)

Graduate Seminar: Selected Topics
Applied course in program planning, design, and evaluation for counselling contexts.

Antirequisite(s): Credit for Educational Psychology 691 and Applied Psychology 691 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 692 6 units; F(3S-0)

Graduate Seminar: Selected Topics
Antirequisite(s): Credit for Educational Psychology 692 and Applied Psychology 692 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 693 3 units; H(3S-0)

Graduate Seminar: Selected Topics
Antirequisite(s): Credit for Educational Psychology 693 and Applied Psychology 693 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 694 6 units; F(1S-3)

Graduate Practicum: Selected Topics
Antirequisite(s): Credit for Educational Psychology 694 and Applied Psychology 694 will not be allowed.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Psychology 695 3 units; H(1S-3)

Graduate Practicum: Selected Topics
Supervised counselling field experience.

Antirequisite(s): Credit for Educational Psychology 695 and Applied Psychology 695 will not be allowed.

Note: Open only to students in the Counselling Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Psychology 698 6 units; F

Pre-Master's Internship in School and Applied Child Psychology
This 1200 hour internship requires the integration and application of the full range of school psychology competencies and domains within an approved setting.

Prerequisite(s): Consent of the Training Director.

Antirequisite(s): Credit for Educational Psychology 698 and Applied Psychology 698 will not be allowed.

Note: Open only to students in the MEd or MSc in School and Applied Child Psychology programs.

NOT INCLUDED IN GPA

Note: 700-level courses are normally available only to students in the doctoral program.

Educational Psychology 701 3 units; H(3-0)

Advanced Research Design, Psychometrics and Statistics in Applied Psychology
Provides intensive exposure to sophisticated quantitative techniques relevant to research design, psychometrics, and statistics such as structural equation modelling (SEM), item-response theory (IRT), and hierarchical linear modelling (HLM).

Prerequisite(s): Educational Psychology 607 or equivalent.

Antirequisite(s): Credit for Educational Psychology 701 and Applied Psychology 701 will not be allowed.

Educational Psychology 702 3 units; H(3-0)

Advanced Theories in Measurement
This advanced seminar course focuses on a variety of topics and issues related to measurement in the social, educational, and behavioural sciences. As we progress through the course, we will cover topics critical to measurement; including principles of scale development (e.g., item writing, scaling), and validity theory (e.g., construct representation and validation). This course is strongly recommended for anyone planning to pursue applied, clinical, or research studies/careers involving the use of tests and/or measures.

Prerequisite(s): Educational Psychology 607 or equivalent.

MAY BE REPEATED FOR CREDIT

Educational Psychology 703 3 units; H(3-0)

Advanced Seminar in Applied Psychology
Doctoral seminar on issues in applied psychology. Dissertation development.

Antirequisite(s): Credit for Educational Psychology 703 and Applied Psychology 703 will not be allowed.

NOT INCLUDED IN GPA

Educational Psychology 705 3 units; H(3-0)

Advanced Seminar in Special Education I
Advanced study of theoretical, empirical, and practical issues affecting individuals with exceptional learning needs.

Prerequisite(s): Educational Psychology 661 or equivalent.

Antirequisite(s): Credit for Educational Psychology 705 and Applied Psychology 705 will not be allowed.

Educational Psychology 709 3 units; H(3-0)

Advanced Seminar in Applied Learning and Developmental Psychology I
Advanced study of theory and practice in human development and learning.

Antirequisite(s): Credit for Educational Psychology 709 and Applied Psychology 709 will not be allowed.

Educational Psychology 731 3 units; H(3-0)

Advanced Clinical Supervision in Applied Psychology
Provides students with formal training in clinical supervision with the intent of raising an awareness of supervision models, as well as a conceptual framework and vocabulary for thinking through their supervision practice.

Antirequisite(s): Credit for Educational Psychology 731 and Applied Psychology 731 will not be allowed.

Note: Open only to doctoral students in Educational Psychology or consent of Graduate Programs in Education.

Educational Psychology 732 3 units; H(3-0)

Advanced Seminar in School and Applied Child Psychology

Seminar series that links theory and research with practice in the school psychology domains of professional competence.

Antirequisite(s): Credit for Educational Psychology 732 and Applied Psychology 732 will not be allowed.

Note: Open only to doctoral students in Educational Psychology or consent of Graduate Programs in Education.

Educational Psychology 741 3 units; H(3-2)

Advanced Professional Skills and Issues

Focuses on providing knowledge and developing skills in the areas of consultation, supervision, and program development and evaluation across the lifespan.

Antirequisite(s): Credit for Educational Psychology 741 and Applied Psychology 741 will not be allowed.

Educational Psychology 742 6 units; F(2-7)

Advanced Practicum in Counselling

Advanced practicum in counselling psychology, and related seminars.

Antirequisite(s): Credit for Educational Psychology 742 and Applied Psychology 742 will not be allowed.

Note: Open only to doctoral students in Counselling Psychology program

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Psychology 760 3 units; H(3-0)

Evidenced-Based Consultation for Intervention

Develops advanced problem-solving consultation skills as an indirect service delivery model. Through role play and consultative work in clinic and/or school settings, students gain hands-on experience in problem identification, problem analysis, plan development/implementation, and plan evaluation/recycling.

Note: Open only to doctoral students in Educational Psychology or consent of Graduate Programs in Education.

Educational Psychology 761 3 units; H(3-1)

Advanced Doctoral Practicum in Clinical Assessment and Supervision

Provides opportunities to apply and develop clinical knowledge and skill as well as best-practice approaches to supervision.

Note: Open only to doctoral students in Educational Psychology.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Psychology 762 3 units; H(3-0)

Advanced Neuropsychological Assessment and Intervention

Builds advanced understanding of neuropsychological approaches to assessment and intervention and the use of the cognitive hypothesis testing model to formulate and test hypotheses.

Note: Open only to doctoral students in Educational Psychology.

Educational Psychology 764 3 units; H(3-2)

Advanced Research Statistics

Provides instruction in advanced statistical methods. Topics include, but are not limited to, multilevel/growth curve modelling, structural equation modelling, and topics related to the measurement of growth and change and the use of advanced statistical software.

Note: Open only to doctoral students in Educational Psychology.

Educational Psychology 766 3 units; H(3-1)

School-Based Practicum

This advanced practicum will provide students with specialized assessment, intervention, analysis, and strategies in school settings under the supervision of registered school psychologists.

Note: Open only to doctoral students in School and Applied Psychology.

NOT INCLUDED IN GPA

Educational Psychology 788 F

Pre-Doctoral Internship in Counselling Psychology

The internship is a full-time commitment over the course of one calendar year or half-time over the course of two consecutive calendar years. The full-time and half-time experiences each provide, at a minimum, 1,600 hours of supervised experience in an approved clinical setting. Practical application of theories and interventions pertaining to individual and group, couple, or family counselling as well as assessment, consultation, and supervision. Experience in addressing a variety of professional issues.

Prerequisite(s): Consent of the Training Director.

Antirequisite(s): Credit for Educational Psychology 788 and Applied Psychology 788 will not be allowed.

Note: Open to students enrolled in the PhD program in Counselling Psychology.

NOT INCLUDED IN GPA

Educational Psychology 792 6 units; F(3-0)

Advanced Seminar: Selected Topics

Antirequisite(s): Credit for Educational Psychology 792 and Applied Psychology 792 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 793 3 units; H(3S-0)

Graduate Seminar: Selected Topics

Antirequisite(s): Credit for Educational Psychology 793 and Applied Psychology 793 will not be allowed.

MAY BE REPEATED FOR CREDIT

Educational Psychology 794 6 units; F(1S-3)

Advanced Practicum: Selected Topics

Antirequisite(s): Credit for Educational Psychology 794 and Applied Psychology 794 will not be allowed.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Psychology 795 3 units; H(1S-3)

Advanced Practicum: Selected Topics

Supervised counselling and school and applied child psychology field experience intended to enhance the professional practice skills of students.

Antirequisite(s): Credit for Educational Psychology 795 and Applied Psychology 795 will not be allowed.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Psychology 798 6 units; F

Pre-Doctoral Internship in School and Applied Child Psychology

The internship is a full-time commitment over the course of one calendar year or half-time over the course of two consecutive calendar years. The full-time and half-time experiences each provide, at a minimum, 1,600 hours of supervised experience involving the theory and practice of evaluations, consultation, interventions, research, and related activities within an approved school, clinic, or other human service agency.

Prerequisite(s): Consent of the Training Director.

Antirequisite(s): Credit for Educational Psychology 798 and Applied Psychology 798 will not be allowed.

Note: Open only to doctoral students in School and Applied Child Psychology.

NOT INCLUDED IN GPA

Educational Research EDER

Additional graduate education courses are offered under the course heading Educational Psychology (EDPS) and undergraduate courses are offered under the course heading Education (EDUC).

Instruction is offered by members of Graduate Programs in Education.

Graduate Courses

Educational Research 603 3 units; H(3-0)

Research Methods

Introduction to various approaches to research in education.

MAY BE REPEATED FOR CREDIT

Educational Research 605 1.5 units; Q(1.5-0)

Special Topics in Professional Development

Note: Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 613 3 units; H(3-0)

Change and Innovation in Education

Examines both traditional and contemporary research literature relevant to change and innovation in educational settings.

Educational Research 617 3 units; H(3-0)

Organizational Theory and Analysis in Education

Human organization as the setting for the delivery of educational services.

Educational Research 619 3 units; H(3-0)

Special Topics in Educational Leadership

Attends to the contemporary and timely debates that shape educational leadership at local, national and international levels. Topics are reflective of the pressing and current issues in educational leadership.

Note: Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 621 3 units; H(3-0)

Assessment of Classroom Learning

Examines both traditional and emerging assessment techniques, including Performance Assessment and Learning Portfolios, for examining students' learning outcomes.

Educational Research 623 3 units; H(3-2)

Topics in Educational Technology
Topics and issues in educational technology.

MAY BE REPEATED FOR CREDIT

Educational Research 625 3 units; H(3-0)

Teacher Evaluation
Examines both traditional and emerging techniques, e.g. portfolios, for assessing teacher performance.

Educational Research 629 3 units; H(3-0)

Special Topics in Assessment/Evaluation
Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 631 3 units; H(3-0)

Special Topics in Workplace and Adult Learning
Examines topics in Workplace and Adult Learning.

MAY BE REPEATED FOR CREDIT

Educational Research 635 3 units; H(3-0)

Topics in Adult Learning
Explores a variety of current topics and discourses pertaining to adult education and adult learning.

Note: Consult current timetable for offerings. This course is for master's and doctoral students in Adult Learning.

MAY BE REPEATED FOR CREDIT

Educational Research 641 3 units; H(3-0)

Research on the Reading Process
Examination and criticism of competing theoretical discourses about the teaching and learning of reading in the elementary school.

Educational Research 649 3 units; H(3-0)

Special Topics in English Language Education
Explores a variety of theoretical perspectives and discourses in English Language Education.

MAY BE REPEATED FOR CREDIT

Educational Research 651 3 units; H(3-0)

Philosophy of Education
Philosophical topics in the context of education. Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 653 3 units; H(3-0)

Sociology of Education
Sociological topics in the context of education. Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 655 3 units; H(3-0)

Comparative Education
Topics in comparative education. Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 657 3 units; H(3-0)

Culture and Gender Studies
Culture and gender topics in the context of education. Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 659 3 units; H(3-0)

History of Education
Historical topics in the context of education. Consult Schedule of Classes for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 664 3 units; H(3-0)

Language and Literacy: Theory and Research
The exploration of ideas, issues, and questions related to and beyond the notions of language and literacy, and how they intersect. An introduction to the principles of language learning from cognitive, sociocultural, and critical perspectives.

MAY BE REPEATED FOR CREDIT

Educational Research 667 3 units; H(3-0)

Second Language Reading and Writing
Research and practice in second language reading and writing; instructional techniques for specific audiences; theories of reading and writing.

Educational Research 668 3 units; H(3-0)

Theory and Research in Languages and Diversity
Topics include the acquisition, use, learning and teaching of language(s) and literacy in a variety of settings.

Note: Consult current timetable for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 669 3 units; H(3-0)

Aspects of Second Language and Culture
Introduction to research and issues on various aspects of second language and culture.

MAY BE REPEATED FOR CREDIT

Educational Research 671 3 units; H(3-0)

Conceptualizing Educational Technology
Seminar to familiarize students with the terrain of educational technology.

Educational Research 673 3 units; H(3-0)

Instructional Design
Integration of theory and practice associated with the selection and sequencing of content across the instructional spectrum and the matching of instructional strategies to characteristics of learners and content.

Educational Research 675 3 units; H(3-0)

Principles of Instructional Development
Topics include the examination of a variety of instructional development models, the systems approach to developing instruction, front-end analysis and needs assessment, risk analysis, constraint analysis, resource analysis, task analysis, and evaluation.

Educational Research 677 3 units; H(3-0)

Distributed Learning
Examination of distributed teaching and learning processes in educational systems with attention to computer mediated teaching and communication and integrated instructional design methodologies. Other topics include media selection, online team-building, social context issues, and leadership of distributed learning organizations.

Educational Research 678 3 units; H(3-0)

Special Topics in Learning Sciences
Examination of current topics and issues in learning sciences and related areas.

MAY BE REPEATED FOR CREDIT

Educational Research 679 3 units; H(3-0)

Special Topics in Educational Technology
Examination of current topics and issues in educational technology and related areas.

MAY BE REPEATED FOR CREDIT

Educational Research 681 3 units; H(3-0)

Studying Curriculum
Curriculum research, theory, and practice with particular reference to curriculum aims, content, organization and change.

Antirequisite(s): Credit for Educational Research 681 and any of 665, 669.27 or 699.42 will not be allowed.

Educational Research 682 3 units; H(3-0)

Conceptualizing Interpretive Inquiry
An introduction to the various approaches to conducting interpretive studies in curriculum.

Note: Required course in MA and MSc Curriculum & Learning programs.

Educational Research 683 3 units; H(3-0)

Curriculum Development, Implementation and Assessment
Making sense of what happens when curriculum policy becomes reality and affects students, teachers, parents and politicians.

Educational Research 685 3 units; H(3-0)

Interpretive Curriculum Discourses
The field of interpretive work in curriculum theory.

Educational Research 687 3 units; H(3-0)

Interpretive Study of Curriculum I
Introduction to the study of curriculum, theory and practice with an emphasis on lived experience at the Master's level.

Antirequisite(s): Credit for Educational Research 687 and either 681 or 683 are not allowed.

Note: Required course in MA and MSc Curriculum & Learning programs.

Educational Research 688 3 units; H(3-0)

Interpretive Study of Curriculum II
In-depth study of the historical movements and philosophical contexts of contemporary curriculum theorizing and practice at the Master's level.

Antirequisite(s): Credit for Educational Research 688 and 685 is not allowed.

Note: Required course in MA and MSc Curriculum & Learning programs.

Educational Research 689 3 units; H(3-0)

Aspects of School Curriculum
Introductory systematic study of research and issues focused on various areas of the school curriculum.

MAY BE REPEATED FOR CREDIT

Educational Research 692 3 units; H(3-0)

Collaboratory of Practice
An examination of real world problems and practices through reviewing the theoretical and research literature linking these to an analytical framework.

MAY BE REPEATED FOR CREDIT

Educational Research 693 3 units; H(3-0)

Interpretive Study of Curriculum
Introduction to the various forms of educational inquiry.

MAY BE REPEATED FOR CREDIT

Educational Research 696 3 units; H(3-2)

Special Topics in Education
Topics designed to prepare foreign-prepared teachers to meet Alberta Education teacher certification requirements.

Note: Normally restricted to students in the Bridge to Teaching program.

MAY BE REPEATED FOR CREDIT

Educational Research 697 1.5 units; Q(1.5-0)

Special Topics
MAY BE REPEATED FOR CREDIT

Educational Research 698 6 units; F(3-0)

Special Topics
MAY BE REPEATED FOR CREDIT

Educational Research 700 6 units; F(3-0)

Seminar for First-Year Doctoral Students
Seminar on selected topics.

Note: Normally restricted to doctoral students.

NOT INCLUDED IN GPA

Educational Research 701 3 units; H(3-0)

Advanced Research Methods
Advanced study in the conduct of research.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 703 3 units; H(3-0)

Directed Study
Individual doctoral study in a selected area.

MAY BE REPEATED FOR CREDIT

Educational Research 705 3 units; H(3-0)

Doctoral Seminar in Educational Leadership
Provides doctoral students with a contemporary Canadian focus on significant issues in educational leadership.

Note: Normally restricted to doctoral students.

Educational Research 707 3 units; H(3-0)

Collaboratory of Practice I
Review the theoretical and research literature and use an analytical framework to explore problems of practice.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Research 708 3 units; H(3-0)

Collaboratory of Practice II
Integrate theoretical, research, and practical knowledge through a focus on data collection and analysis.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Educational Research 709 3 units; H(3-0)

Dissertation Seminar I
Undertaking a doctoral research study after the successful passing of the candidacy exam.

NOT INCLUDED IN GPA

Educational Research 710 3 units; H(3-0)

Dissertation Seminar II
Ongoing engagement in doctoral research activities as appropriate to the research timelines, research design and methodology, and requirements for writing and defending the dissertation.

NOT INCLUDED IN GPA

Educational Research 719 3 units; H(3-0)

Advanced Special Topics in Educational Leadership
Provides doctoral students with advanced exploration of diverse, contemporary topics in k-12 and post-secondary learning organizations.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 733 3 units; H(3-0)

Advanced Workplace and Adult Learning
Advanced exploration of diverse topics in workplace and adult learning.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 735 3 units; H(3-0)

Advanced Topics in Adult Learning
Drawing from a foundational understanding and appreciation of adult education and adult learning, this course provides a deeper exploration of current topics and discourses that inform this field of scholarship and practice.

Note: Normally restricted to doctoral students. Consult current timetable for offerings. Doctoral students are encouraged to discuss enrolment in this course with their supervisor, to determine if they have a foundational understanding of adult education and adult learning (acquired through previous course work or related work experience).

MAY BE REPEATED FOR CREDIT

Educational Research 741 3 units; H(3-0)

Advanced Seminar in Theory and Research in Literacy Education
A critical examination of theories, models, and research that underpin literacy education.

Note: Normally restricted to doctoral students.

Educational Research 764 3 units; H(3-0)

Advanced Language and Literacy: Theory and Research
A deeper exploration of ideas, issues, and questions that relate to and go beyond notions of language and literacy, and how they intersect. An examination of the principles of language learning from cognitive, sociocultural, and critical perspectives.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 768 3 units; H(3-0)

Theory and Research in Languages and Diversity
Topics include current issues in languages and diversity, assessment and evaluation, language policy and planning, and language-identity-democracy.

Note: Normally restricted to doctoral students. Consult current timetable for offerings.

MAY BE REPEATED FOR CREDIT

Educational Research 770 3 units; H(3S-0)

Historical and Philosophical Foundations in Learning Sciences
An examination of theories, designs, and practices in learning sciences. Examination of the cognitive and social processes that constitute learning, teaching, and development in and across diverse settings—both formal and informal.

Note: Normally restricted to doctoral students in the Learning Sciences specialization.

Educational Research 771 3 units; H(3S-0)

Doctoral Seminar in Educational Technology
An examination of the historical and philosophical foundations of field informs the critical analysis of current and emerging research in educational technology. In this seminar, doctoral students study research and methodology across domains of the field, standards for practice, emerging trends and leading, teaching and learning with technology in diverse contexts.

Note: Normally restricted to doctoral students in Educational Technology specialization.

Educational Research 772 3 units; H(3S-0)

Advanced Seminar in Design
An introduction to various perspectives on designing formal and informal learning environments in technological and non-technological settings. Exploration of research approaches and methodologies in the scope of design thinking and the structure, nature, contexts, and assessment practices of learning environments. Engagement with applications of theory to practice through structured internships.

Note: Normally restricted to doctoral students in the Learning Sciences specialization.

Educational Research 773 3 units; H(3S-0)

Advanced Seminar in Design and Development of Learning
An exploration of advances and trends in learning and instructional design and development theory and evaluation; investigate collaboration and community; participatory cultures, innovation and change research, learning science theory, and knowledge building.

Note: Open to doctoral students from across educational specializations.

Educational Research 774 3 units; H(3S-0)

Leadership, Learning, and Systemic Change
An exploration of systemic and organizational change and innovation theories in relation to leading teaching and learning in agile and changing educational systems and networks. The role of leadership in advancing research and developing systemic change will be examined.

Note: Open to doctoral students from across educational specializations.

Educational Research 775 3 units; H(3S-0)

Advanced Seminar in Technology Enabled Learning Environments
An evaluation of prevalent and promising distributed, blended and collaborative learning environments through design, development and inclusive learning perspectives; analysis of affordances and constraints of mobile, dynamic and participatory realities and integrative networks.

Note: Open to doctoral students from across educational specializations.

Educational Research 777 3 units; H(3S-0)

Advanced Seminar in Leading Systemic Change
Key concepts include issues of systemic change, network/systems theory, diffusion of innovations and change theories, complex adaptive leadership, and opportunities for transformed leadership, teaching and learning in agile and changing education systems and networks.

Note: Open to doctoral students from across educational specializations.

Educational Research 778 3 units; H(3-0)

Advanced Learning Sciences
Advanced concepts in learning sciences.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 779 3 units; H(3-0)

Advanced Educational Technology
Advanced concepts in educational technology.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 781 3 units; H(3-0)

Conceptualizing Curriculum Research
Analysis of different approaches to curriculum research, especially assumptions, meaning frameworks, and views of the theory/practice relationship.

Note: Normally restricted to doctoral students.

Educational Research 782 6 units; F(3-0)

Interpretive Study of Curriculum III
In-depth study of the various approaches to conducting interpretive studies in curriculum, teaching and learning at the doctoral level.

Note: Normally restricted to doctoral students.

Educational Research 784 3 units; H(3-0)

Doctoral Seminar on Perspectives of Learning
Study of particular aspects of Learning Theory at the doctoral level.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 785 3 units; H(3-0)

Advanced Study of Interpretive Curriculum Discourses
An advanced study of interpretive curriculum discourses focusing on cutting-edge examples of such work.

Note: Normally restricted to doctoral students.

Educational Research 786 3 units; H(3-0)

Doctoral Seminar in Interpretive Curriculum Discourses
Study of particular aspects of Interpretive Curriculum Discourses at the doctoral level.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Educational Research 798 6 units; F(3-0)

Advanced Special Topics
Provides doctoral students with advanced exploration and study of emerging topics in education.

Note: Normally restricted to doctoral students.

MAY BE REPEATED FOR CREDIT

Electrical Engineering ENEL

Instruction offered by members of the Department of Electrical and Computer Engineering in the Schulich School of Engineering.

Electrical Engineering 101
1.5 units; Q(16 hours)

Computing Tools I
Introduction to computing tools in Electrical engineering. Basic data input/output and arithmetic operations; matrix variables; interpreted programming scripts and data management; plotting; functions. Applications in numerical methods and analysis.

Prerequisite(s): Engineering 233.

NOT INCLUDED IN GPA

Electrical Engineering 102
1.5 units; Q(16 hours)

Computing Tools II
Methods for solving electrical engineering problems using computing tools for the solution of: multivariable linear and non-linear equations; polynomial curve-fitting; single and multi-variable integration; function optimization; differential equations. Graphical data representation.

Prerequisite(s): Electrical Engineering 101 and Applied Mathematics 307 or Mathematics 375.

NOT INCLUDED IN GPA

Senior Courses

Electrical Engineering 300 3 units; H(2-3)

Electrical and Computer Engineering Professional Skills
Introduction to the electrical and computer engineering profession, fundamentals of electrical and computer engineering design, testing, and product development; critical thinking and problem solving skills development; electrical engineering standards, regulatory issues, intellectual property protection, research methods, project management, identifying market needs and commercialization considerations. Case studies and projects may be drawn from a range of electrical and computer engineering areas.

Prerequisite(s): Engineering 225, Engineering 233 and Electrical Engineering 353.

Electrical Engineering 327 3 units; H(3-1.5T)

Signals and Transforms
Continuous-time systems. Impulse response and convolution. Fourier series and Fourier transform. Basics of discrete time signals. Sampling theory. Discrete convolution. Difference equations and the Z-transform. Discrete-time Fourier representations.

Prerequisite(s): Mathematics 375 or Applied Mathematics 307.

Electrical Engineering 343 3 units; H(3-1T-3/2)

Circuits II
Laplace transform methods for circuit analysis. Transfer functions and series and parallel resonance. Basic filter theory and Bode diagrams. Natural, step, and transient responses of RL, RC, and RLC circuits. Two-port circuits. Two-port circuit parameters: admittance, impedance and hybrid parameters.

Prerequisite(s): Mathematics 375 or Applied Mathematics 307 and Engineering 225.

Corequisite(s): Electrical Engineering 327.

Electrical Engineering 353 3 units; H(3-1T-3/2)

Digital Circuits
Number systems and simple codes. Combinational logic: Boolean algebra, truth tables, minterms, maxterms, Karnaugh maps; gates, buffers, multiplexers and decoders; combinational circuit timing. Sequential circuits: latches and D flip flops; timing considerations; analysis and synthesis techniques; Mealy and Moore machine models; counters and registers. Introduction to memory arrays.

Prerequisite(s): Admission to Electrical Engineering or Software Engineering, or Computer Science 233 and Mathematics 271.

Antirequisite(s): Credit for Electrical Engineering 353 and Computer Science 321 will not be allowed.

Electrical Engineering 361 3 units; H(3-1T-3/2)

Electronic Devices and Materials
Properties of atoms in materials, classical free electron model, conduction electrons in materials, and band electrons. Properties of semiconductors and insulators; Doping and PN Junctions, Diodes, rectifier and clamping circuits, BJTs, MOSFETs.

Prerequisite(s): Engineering 225 and Mathematics 277 or Applied Mathematics 219.

Electrical Engineering 400 3 units; H(1-3)

Electrical Engineering Design and Technical Communications
Fundamentals of electrical and computer engineering design, testing, and product development; critical thinking and problem solving skills development; electrical engineering standards, regulatory issues, project management, and leadership. Effective and efficient writing will be emphasized. Case studies and projects may be drawn from a range of electrical and computer engineering areas.

Prerequisite(s): Electrical Engineering 300, 327 and 343.

Electrical Engineering 419 3 units; H(3-1.5T)

Probability and Random Variables
Expressing engineering data and systems in terms of probability, introduction to probability theory, discrete and continuous random variables, functions of random variables, goodness-of-fit testing hypothesis testing and stochastic processes. Applications chosen from electrical engineering.

Prerequisite(s): Electrical Engineering 327.

Antirequisite(s): Credit for Electrical Engineering 419 and either Engineering 319 or Biomedical Engineering 319 will not be allowed.

Electrical Engineering 441 3 units; H(3-1T-3/2)

Control Systems I
Component modelling and block diagram representation of feedback control systems. Mathematical modelling of dynamic systems; state-space representation and frequency domain representation of dynamic systems. Transient response analysis and steady-state error analysis. Root-locus analysis and design. Frequency response analysis with Bode and Nyquist stability criterion. Compensation design techniques. Introduction to multi sensor state feedback compensator design. Overview of digital control systems and industrial controllers.

Prerequisite(s): Electrical Engineering 327.

Electrical Engineering 453 3 units; H(3-1T-3/2)

Digital Systems Design
Design, implementation and testing of a digital system. Mask programmable and field programmable technology. Logic design for integrated

systems. Design for testability. Real versus ideal logic design. CAD tools for digital systems design: simulation, synthesis and fabrication.

Prerequisite(s): Electrical Engineering 353 and 361 and Engineering 225.

Electrical Engineering 469 3 units; H(3-1T-3/2)

Analog Electronic Circuits
BJT biasing, load-line analysis, BJT as amplifier and switch, small-signal model, single-stage and two-stage small-signal BJT amplifiers, current sources and current steering, differential pair and multistage BJT amplifiers, BJT power amplifiers, operational amplifier circuits.

Prerequisite(s): Electrical Engineering 361.

Electrical Engineering 471 3 units; H(3-1T-3/2)

Introduction to Communications Systems and Networks
Introduction to communications systems and networks. Analog communications concepts including filtering and analog modulation. Sampling and digital communications concepts including binary baseband/passband modulation, matched filtering and detection. Telecommunications and data network fundamentals including network protocol architectures, design and performance.

Prerequisite(s): Electrical Engineering 327.

Electrical Engineering 475 3 units; H(3-2T)

Electromagnetic Fields and Applications
Electrostatic and magnetostatic fields and applications; applications of vector calculus for electromagnetics; introduction to Maxwell's equations for time-varying fields; plane wave propagation.

Prerequisite(s): Physics 259 and Mathematics 375 or Applied Mathematics 307.

Electrical Engineering 476 3 units; H(3-1T-3/2)

Electromagnetic Waves and Applications
Plane wave propagation, reflection, and refraction; transmission line theory and applications; introduction to scattering parameters, matching networks, Smith charts; propagation in waveguides; cavities and resonant modes; advanced topics.

Prerequisite(s): Electrical Engineering 475.

Electrical Engineering 487 3 units; H(3-1T-3/2)

Electrical Engineering Energy Systems
Energy resources and electric power generation, transmission and distribution; simple generator and load models, transformers, transmission lines, and circuit breakers. Power system analysis: per unit representation, power flow, fault analysis and protection.

Prerequisite(s): Engineering 225.

Antirequisite(s): Credit for Electrical Engineering 487 and 387 will not be allowed.

Electrical Engineering 489 3 units; H(3-1T-3/2)

Modelling and Control of Electric Machines and Drives
Principles of electromechanical energy conversion. Rotating Machines (DC, Synchronous and Induction machines). Synchronous Generator voltage and power control, motor drive systems.

Prerequisite(s): Engineering 225.

Electrical Engineering 500 6 units; F(1-3)

Computer, Electrical, and Software Engineering Team Design
Preliminary and detailed engineering design and implementation of an engineering system that applies engineering knowledge to solving a real-life problem. The emphasis is on the design process as it is associated with electrical, computer and software engineering, design methodology, general design principles for engineers, teamwork and project management.

Prerequisite(s): Fourth year standing or above.

Antirequisite(s): Credit for Electrical Engineering 500 and either 583 or 589 will not be allowed.

Electrical Engineering 503 3 units; H(3-2)

Computer Vision
Introduction to the fundamentals of computer vision. Video signal acquisition and representation; filtering and compression; motion detection and estimation; object tracking and detection.

Prerequisite(s): Electrical Engineering 327 and Computer Engineering 339.

Electrical Engineering 514 3 units; H(3-1T)

Introduction to Nanotechnology
Introduction to nanotechnology, limits of smallness, quantum nature of the nanoscaled materials, Nanotechnology device fabrication and characterization techniques, Nanotechnology applications.

Prerequisite(s): Electrical Engineering 469 or Computer Engineering 467.

Antirequisite(s): Credit for Electrical Engineering 514 and Computer Engineering 519.37 will not be allowed.

Electrical Engineering 519 3 units; H(3-2) or H(3-0)

Special Topics in Electrical Engineering
Current topics in electrical engineering.

Prerequisite(s): Consent of the Department.

Note: Consult Department for announcement of topics.

MAY BE REPEATED FOR CREDIT

Electrical Engineering 525 3 units; H(3-2)

Neuro-Fuzzy and Soft Computing
Neural networks: neuron models and network architectures; preceptrons; Widrow-Hoff learning and the backpropagation algorithm; associative memory and Hopfield networks; unsupervised learning. Fuzzy systems: basic operations and properties of fuzzy sets; fuzzy rule generation and defuzzification of fuzzy logic; fuzzy neural networks. Applications in areas such as optimization, signal and image processing, communications, and control. Introduction to genetic algorithms and evolutionary computing. Introduction to chaos theory.

Prerequisite(s): Electrical Engineering 327.

Electrical Engineering 529 3 units; H(3-1T-2)

Wireless Communications Systems
Overview of terrestrial wireless systems including system architecture and industry standards; propagation characteristics of wireless channels; modems for wireless communications; cells and cellular traffic; cellular system planning and engineering; fading mitigation techniques in wireless systems; multiple access techniques for wireless systems.

Prerequisite(s): Electrical Engineering 471 and one of Engineering 319 or Electrical Engineering 419.

Electrical Engineering 541 3 units; H(3-1T-3/2)

Control Systems II
Introduction to sampled-data control systems, discretization of analog systems, discrete-time signals and systems, causality, time-invariance, z-transforms, stability, asymptotic tracking, state-space models, controllability and observability, pole assignment, deadbeat control, state observers, observer-based control design, optimal control.

Prerequisite(s): Electrical Engineering 441.

Electrical Engineering 559 3 units; H(3-2/2)

Analog Filter Design
This class deals with the theory and design of active filters, for audio-frequency applications, using op amps. It consists, basically, of two phases. Phase 1 deals with the realization of a given transfer function using cascade of first and/or second-order RC-op amps circuits. In phase II, the transfer functions of filters are studied in combination with frequency-response approximations such as Butterworth, Chebyshev, Inverse-Chebyshev, Cauer (or Elliptic) and Bessel-Thompson.

Prerequisite(s): Electrical Engineering 469 and 471.

Electrical Engineering 562 3 units; H(3-0)

Photovoltaic Systems Engineering
Prospect of photovoltaics in Canada; solar radiation; fundamentals of solar cell; photovoltaic system design; grid connected photovoltaic systems; mechanical and environmental considerations.

Prerequisite(s): Electrical Engineering 361.

Antirequisite(s): Credit for Electrical Engineering 562 and 519.07 will not be allowed.

Electrical Engineering 563 3 units; H(3-2)

Biomedical Signal Analysis
Introduction to the electrocardiogram, electroencephalogram, electromyogram, and other diagnostic signals. Computer techniques for processing and analysis of biomedical signals. Pattern classification and decision techniques for computer-aided diagnosis. Case studies from current applications and research.

Prerequisite(s): Electrical Engineering 327.

Electrical Engineering 565 3 units; H(3-1T-2/2)

Digital Integrated Electronics
Semiconductor devices, modelling of CMOS switching, CMOS logic families, performance and comparison of logic families, interconnect, semiconductor memories, design and fabrication issues of digital IC's.

Prerequisite(s): Computer Engineering 467.

Electrical Engineering 567 3 units; H(3-2/2)

CMOS Analog Circuit Design
Introduction to CMOS very large-scale integrated (VLSI) circuit design. Review of MOS transistor theory and operation. Introduction to CMOS circuits. CMOS processing, VLSI design methods and tools. CMOS subsystem and system design for linear integrated circuits.

Prerequisite(s): Electrical Engineering 469 and Computer Engineering 467.

Antirequisite(s): Credit for Electrical Engineering 567 and 519.47 will not be allowed.

Electrical Engineering 569 3 units; H(3-1T-3/2)

Electronic Systems and Applications
Introduction to electronic systems; the four elements of electronic monitoring systems; system modelling; sensors; amplifiers; noise characterization; power supplies; frequency conditioning; active filters; analog to digital conversion and anti-aliasing requirements; multichannel data acquisition; real-time conditioning of signals; real-time control.

Prerequisite(s): Electrical Engineering 469.

Electrical Engineering 571 3 units; H(4-1.5/2)

Digital Communications
Fundamentals of digital communication systems. Digital coding of analog waveforms; digital pulse modulation, pulse code modulation, delta modulation. Intersymbol interference; baseband transmission, correlative coding. Probability theory. Optimal demodulation of data transmission; matched filtering; bit error rate.

Prerequisite(s): Electrical Engineering 471 and one of Engineering 319 or Electrical Engineering 419.

Electrical Engineering 573 3 units; H(3-1T)

Computer Networks
Overview of the network protocol stack. Reliable communications over a link; medium access; packet routing; the transport and application layers. Data and network security. Internet and telecommunications packet network architectures. Mathematical network analysis and network performance software tools.

Prerequisite(s): Engineering 319 or Electrical Engineering 419.

Antirequisite(s): Credit for Computer Science 441 and Electrical Engineering 573 will not be allowed.

Electrical Engineering 574 3 units; H(3-2/2)

Microwave Transistor Amplifiers and Oscillators
Theory and design of microwave transistor amplifiers and oscillators for wireless and satellite communications applications. Modelling and analysis of lumped and distributed RF networks, Analysis and design of passive structures and impedance matching networks, Perform power, noise and distortion calculations for communications systems, Analysis and design of small signal amplifiers and low noise and balanced amplifiers. Prototyping using printed circuit board technology, introduction to Computer Aided Design (CAD) tools and Computer Aided Testing Equipment.

Prerequisite(s): Electrical Engineering 343 and 475.

Antirequisite(s): Credit for Electrical Engineering 574 and 519.49 will not be allowed.

Electrical Engineering 575 3 units; H(3-1T-3/2)

Radio-frequency and Microwave Passive Circuits
Study and design of radio-frequency and microwave passive circuits such as filters, couplers, splitters, combiners, isolators, circulators; advanced transmission lines; antenna fundamentals; network analysis; advanced topics.

Prerequisite(s): Electrical Engineering 476.

Electrical Engineering 585 3 units; H(3-2/2)

Introduction to Power Electronics
Commutation. Diode rectifiers. Fully controlled 3-phase rectifiers. Choppers, inverters, ac controllers. Single-phase switch mode converters: dc-to-dc, ac-to-dc, dc-to-ac. Circuit and state-space averaging techniques. Switching devices and magnetics.

Prerequisite(s): Electrical Engineering 469.

Electrical Engineering 586 3 units; H(3-2)

Power System Protection
Power System Protection philosophy, Short circuit calculation, Protective relaying fundamentals and design principles, Over-current relay co-ordination, Relay input sources, System Grounding, generator protection, Transformer Protection, Transmission line protection.

Prerequisite(s): Electrical Engineering 487.

Antirequisite(s): Credit for Electrical Engineering 586 and 519.50 will not be allowed.

Electrical Engineering 587 3 units; H(3-1T-3/2)

Power Systems
Three-phase systems, per unit representation, power system elements and configurations, transmission system representation and performance, power flow studies, symmetrical components, fault studies, economics of power generation, transient and steady-state stability, swing equation.

Prerequisite(s): Electrical Engineering 487 or 489.

Electrical Engineering 591 3 units; H(0-6)

Individual Computer, Electrical, and Software Engineering Design Project
This project involves individual work on an assigned Computer, Electrical or Software Engineering design project under the supervision of a faculty member. The project will normally involve following an established design process. Engineering Communications, including written reports, logbooks and oral presentations.

Prerequisite(s): Formal approvals from the project supervisor and course co-ordinator(s).

Electrical Engineering 592 3 units; H(0-6)

Undergraduate Research Thesis - Part A
A directed studies research project in an area of interest, directed by a project advisor/faculty member. Includes an independent student component covering the scientific process, ethics, review of literature, and writing scientific proposals and manuscripts. Projects may involve experimental, analytical or computer modelling studies.

Prerequisite(s): Admission to Electrical or Software Engineering and formal approval of the project supervisor and course co-ordinator(s).

Electrical Engineering 593 3 units; H(3-1T-2/2)

Digital Filters
Recursive and non-recursive systems. Time-domain and frequency-domain analysis. Z-transform, bilinear transform and spectral transformations. Filter structures and non-ideal performance.

Prerequisite(s): Electrical Engineering 327.

Electrical Engineering 594 3 units; H(0-6)

Undergraduate Research Thesis - Part B
A directed studies research project intended for students who have completed a suitable Electrical Engineering 592 project and wish to continue the assigned project by completing a more extensive investigation. The course culminates with a written thesis and presentation. Projects may involve experimental, analytic and computer modelling studies.

Prerequisite(s): Electrical Engineering 592, admission to Electrical or Software Engineering and formal approval from the project supervisor and course co-ordinator(s).

Electrical Engineering 597 3 units; H(3-1T-3/2)

Power Systems Operation and Markets
Power system operation and economic load dispatch, concept of marginal cost, Kuhn-Tucker's conditions of optimum, unit commitment, hydro-thermal co-ordination, power flow analysis, optimal power flow, probabilistic production simulation, power pools and electricity markets, market design, auction models, power system reliability, primary and secondary frequency control and AGC, steady-state and transient stability, power sector financing and investment planning.

Prerequisite(s): Electrical Engineering 487, 489 or 587.

Electrical Engineering 599 3 units; H(0-6)

Individual Computer, Electrical, and Software Engineering Design Project - Part B
This individual project is intended for students who have completed a suitable Electrical Engineering 591 Individual Project and wish to continue the assigned research project by completing a more extensive project. The project will normally involve following an established design process. Engineering Communications, including written reports, logbooks, and oral presentations.

Prerequisite(s): Electrical Engineering 591 and formal approval from the project supervisor and course co-ordinator(s).

Graduate Courses

Registration in all courses requires the approval of the Department of Electrical and Computer Engineering.

Electrical Engineering 601 3 units; H(3-0)

Power System Operation
Energy transfer in power systems; real and reactive power flows; VAR compensation. Power system control, interconnected operation. Power system stability, techniques of numerical integration. Load representation, power quality. Computational paradigms for typical power system problems. Computer simulation of representative power system problems.

Electrical Engineering 602 3 units; H(3-1) (formerly Software Engineering for Engineers 619.71)

Virtual Environments and Applications
Introduction to virtual reality (VR) technologies; Characterization of virtual environments; hardware and software; user interfaces; 3D interaction; research trends. Applications: medicine, manufacturing, oil and gas reservoirs, the arts, and education.

Prerequisite(s): Software Engineering for Engineers 409.

Electrical Engineering 603 3 units; H(3-0)

Rotating Machines
General theory of rotating machines providing a unified approach to the analysis of machine performance. General equations of induced voltage and torque. Transient performance of machines.

Electrical Engineering 604 3 units; H(3-1)

System Design of Wireless Transceivers
Linear and nonlinear system analysis. Radio architectures – super-heterodyne, low intermediate frequency, direct conversion, sub-sampling; receiver system analysis and design; transmitter system analysis and design. Applications of transceiver system design to satellite and wireless communications.

Prerequisite(s): Electrical Engineering 327 and Electrical Engineering 471.

Antirequisite(s): Credit for Electrical Engineering 604 and 619.38 will not be allowed.

Electrical Engineering 606 3 units; H(3-0)

Optical Instrumentations
Review of ray and wave optics. Free-space and fiber optic components. Linear, non-linear, and super-resolution microscopy. Light measurement

and characterization. Digital imaging. Solid state light sources. Spectroscopy.

Antirequisite(s): Credit for Electrical Engineering 606 and 619.68 will not be allowed.

Electrical Engineering 609 1.5 units; Q(3-1)

Special Topics
Designed to provide graduate students, especially at the PhD level, with the opportunity of pursuing advanced studies in particular areas under the direction of a faculty member.

MAY BE REPEATED FOR CREDIT

Electrical Engineering 611 3 units; H(3-0)

Digital Systems
Introduction to digital system design for mask programmable and field programmable gate arrays. CMOS digital logic design. Flip-flop timing and metastability. Design for testability. CAD tools for digital systems design.

Electrical Engineering 613 3 units; H(3-1)

RF Power Amplifiers and Transmitters
This is an advanced level graduate course, dealing with the theory, design and optimization of RF power amplification systems for wireless and satellite communication applications. The course provides a details treatment of linear and non-linear characterization and modelling of amplifiers/transmitters from device to system level perspective. Theory of operation as well as design techniques of linear amplifiers (class A, AB, B, C), switching mode amplifiers (class E, D and F) and balanced amplifiers are presented. Linearization and power efficiency enhancements techniques of power amplifiers/transmitters are also covered.

Prerequisite(s): Electrical Engineering 574 or consent of the instructor.

Antirequisite(s): Credit for Electrical Engineering 613 and 619.22 will not be allowed.

Electrical Engineering 615 3 units; H(3-0)
(formerly Electrical Engineering 619.16)

Non-linear Control
Non-linear systems; phase portraits, equilibrium points, and existence of solutions. Lyapunov stability definitions and theorems. Non-linear control design; feedback linearization, sliding modes, adaptive control, backstepping, and approximate-adaptive control. Frequency domain stability analysis using describing functions.

Electrical Engineering 617 3 units; H(3-0)

RF Integrated Circuit Design
Introduction to complementary metal oxide semiconductor (CMOS) wireless communication circuits; computer-aided design; impedance matching concepts; passive circuit elements in monolithic circuits; radio frequency integrated circuit building blocks.

Prerequisite(s): Electrical Engineering 567 or 647.

Antirequisite(s): Credit for Electrical Engineering 617 and 619.31 will not be allowed.

Electrical Engineering 619 3 units; H(3-1) or H(3.0)

Special Problems
Designed to provide graduate students, especially at the PhD level, with the opportunity of pursuing advanced studies in particular areas under the direction of a faculty member.

MAY BE REPEATED FOR CREDIT

Electrical Engineering 623 3 units; H(3-1)

Biomedical Systems and Applications
Introduction to biomedical systems. The four elements of a biomedical monitoring system. Biomedical system modelling. Biomedical sensors: basic concepts. Biomedical amplifiers and signal conditioning circuits. Noise, noise sources and non-idealities. Repeatability of measurements. Power supplies for biomedical monitoring systems. Frequency conditioning. Isolation amplifiers and patient safety. Analog-to-Digital conversion and anti-aliasing requirements. Multichannel biomedical data acquisition. Real-time requirements. Real-time digital conditioning of biomedical signals. The concept of closed-loop real-time control.

Prerequisite(s): Consent of the Department.

Electrical Engineering 625 3 units; H(3-0)

Estimation Theory
Estimation theory as applied in communication systems, signal processing, measurement systems, geophysical systems, biomedical engineering and geomatics engineering. Estimators covered include: MVU, BLUE, LS, ML, Bayesian and MMSE. Concepts covered include: CRLB, Neyman-Fisher and Sufficient Statistics.

Electrical Engineering 627 3 units; H(3-0)

Antennas
Foundations of theory and practice of modern antennas. Topics covered will include: theoretical background, antenna parameters, simple radiators, antenna array theory, wire antennas, broadband antennas, microstrip antennas, aperture radiators, base station antennas, antennas for mobile communications, antenna measurements.

Note: Students registering in this course should have a background in electromagnetics and basic microwave engineering.

Electrical Engineering 629 3 units; H(3-0)

Advanced Logic Design of Electronic and Nanoelectronic Devices
Two-level and multi-level logic synthesis; flexibility in logic design; multiple-valued logic for advanced technology; multi-level minimization; Binary Decision Diagrams, Word-level Decision Diagrams, sequential and combinational equivalence checking; technology mapping; technology-based transformations; logic synthesis for low power, optimizations of synchronous and asynchronous circuits, logical and physical design from a flow perspective; challenges of design of nanoelectronic devices.

Electrical Engineering 631 3 units; H(3-0)

System Identification and Parameter Estimation
Parametric models of linear time-invariant systems. System and noise models. Estimation of model parameters. Structure and order selection. Model validation. Convergence and sensitivity analysis. Experiment design. MIMO systems. Subspace methods. Introduction to non-linear and/or time-varying systems.

Prerequisite(s): Electrical Engineering 649.

Electrical Engineering 633 3 units; H(3-0)

Wireless Networks
Wireless networks' architectures and standards. Wireless communication protocols including network access control protocols, routing, congestion and flow control protocols, mobility and resource management protocols. Modelling and analysis of wireless network performance. Current and future research challenges in wireless networks.

Note: A senior undergraduate course in wireless communications is suggested as preparation for this course.

Electrical Engineering 635 3 units; H(3-0)

Cryptography and Number Theory with Applications
The topic of the course is to provide the students with vital information about the use of number theory in designing and implementing various public key cryptographic schemes. We will stress on the efficacy of the algorithms used and their application in areas outside cryptography and coding theory.

Antirequisite(s): Credit for Electrical Engineering 635 and 619.87 will not be allowed.

Electrical Engineering 637 3 units; H(3-0)

Arithmetic Techniques with DSP Applications
The course is aimed at the use of specific computer arithmetic techniques for efficient design of DSP algorithms. We will provide comprehensive information form the theory of computer arithmetic. We will show how the performance of different algorithms can be optimized by using efficient arithmetic techniques. Many examples will be provided.

Antirequisite(s): Credit for Electrical Engineering 637 and 619.88 will not be allowed.

Electrical Engineering 639 3 units; H(3-0)

Radio Frequency and Microwave Circuit Design
Circuit design via transmission line elements: special emphasis on microstrip circuits and effects of discontinuities (corners, Tees, and impedance steps). Analysis of passive impedance matching and filtering circuits using distributed and lumped elements. Narrow band matching and wide band matching techniques as well as wide band matching to a complex load. One and two port small signal amplifiers. Scattering parameter design methods: amplifier gain, input and output matching and stability. Computer aided design methods and broadband design methods. Large signal transistor amplifiers: device non-linearities and design methodologies.

Electrical Engineering 641 3 units; H(3-0)
(formerly Electrical Engineering 619.05)

Optimization for Engineers
Introduction to optimization techniques for solving engineering problems. Modelling engineering problems as optimization problems. Recognizing and solving convex sets, functions and optimization problems. Numerical linear algebra including; matrix structure, algorithm complexity, LU factorization. Unconstrained optimization methodology and engineering applications. Constrained optimization techniques and engineering applications.

Prerequisite(s): Engineering 407 or consent of the instructor

Antirequisite(s): Credit for Electrical Engineering 641 and 619.05 will not be allowed.

Electrical Engineering 643 3 units; H(3-0)

Fibre Optics Transmission
Fundamental theory of cylindrical optical waveguides by way of Maxwell's equation and the modal analysis of the slab waveguides, step-index and graded-index fibres, review of fibre chemistry and production techniques. Problem areas relating to measurement of fibre parameters. Optical transmitters, photodetectors and receivers, modulation and multiplexing techniques, splices and connectors. Multiterminal analog and digital

system analysis and design. Optical switching and amplification, integrated optics.

Electrical Engineering 645 3 units; H(3-0)
(formerly Electrical Engineering 619.51)

Data Mining and Knowledge Discovery
Types of data mining: classification, clustering, association, prediction. Processes: data preparation, model building. Techniques: decision tree, neural network, evolutionary computing, Bayesian network. Applications: multi-media, text and web mining.

Electrical Engineering 647 3 units; H(3-0)

Analog Integrated Circuit Design
Review of static and dynamic models of bipolar and field effect transistors. Basics of analog integrated circuit design. Computer-aided modelling. Fabrication processes and their influence on analog design. Operational voltage amplifier and transconductance amplifier design techniques. Case studies of bipolar and complementary metal oxide semiconductor (CMOS) designs. CMOS analog integrated circuit design project.

Electrical Engineering 649 3 units; H(3-0)
(formerly Electrical Engineering 619.22)

Random Variables and Stochastic Processes
Axiomatic view of probability; continuous and discrete random variables; expectation; functions of random variables; conditional distributions and expectations; stochastic processes; stationarity and ergodicity; correlation and power spectrum; renewal processes and Markov chains; Markov and non-Markovian processes in continuous time.

Electrical Engineering 651 3 units; H(3-0)
(formerly Electrical Engineering 619.04)

Resource Management for Wireless Networks
Qualitative and mathematical formulation of the resource management problem in wireless networks; elements of radio resource management: power and Walsh code allocation and control. Call admission control, traffic load control, packet scheduling; radio resource management algorithms: fixed resource allocation, handover resource management, transmitter power management, dynamic resource allocation, and packet scheduling algorithms; quality-of-service (QoS) and resource management; joint radio resource management problem across heterogeneous wireless networks; applications and case studies: resource management in third generation (3G) and beyond 3G wireless Internet Protocol (IP) networks; open research challenges in resource management for wireless networks.

Electrical Engineering 653 3 units; H(3-1T-3/2)
(formerly Electrical Engineering 619.23)

Theory and Practice Advanced DSP Processor Architecture
Architecture and capabilities of SISD, SIMD and VLIW processors; Developing high speed algorithms: code timing, reliability, background DMA activity, maintainability; Developing a personal software process appropriate for embedded systems.

Electrical Engineering 655 3 units; H(3-0)

Discrete Time Signal Processing
Foundations of discrete time signal processing of deterministic and stochastic signals. Transform analysis: Laplace, Fourier, discrete time Fourier, Z transform, DFT/FFT and Hilbert. Time sampled signals, mixed digital/analog LTI system design and analysis with practical DSP implementations. Fundamentals of FIR/IIR/multirate DSP filter implementation and analysis. Application of DSP in communications receiver, audio, image and video processing.

Electrical Engineering 657 3 units; H(3-0)
(formerly Electrical Engineering 619.73)

Detection of Signals in Noise
Detection of distorted and noise corrupted deterministic and random signals. Application to optimum statistical signal processing algorithms in data communications, GPS, radar, synchronization and image processing.

Prerequisite(s): At least one of Electrical Engineering 675, 649, or 625 or consent of the instructor.

Electrical Engineering 659 3 units; H(3-0)

Active-RC and Switched-Capacitor Filter Design
The filter design problem; operational amplifier characteristics; cascade methods of RC-active filter design; filter design with the active biquad; active filter design based on a lossless ladder prototype. Switched-capacitor (SC) integrators; design of cascade, ladder, and multiple feedback SC filters; non-ideal effects in SC filters; scaling of SC filters; topics in fabrication of SC filters.

Electrical Engineering 661 3 units; H(3-0)
(formerly Electrical Engineering 619.18)

Grid-Connected Inverters for Alternative Energy Systems
Analysis and design of grid-connected inverters fed by an alternative energy source. Switch mode converters, inverter topologies, harmonics, drive electronics, control methodologies, implementation techniques, course project.

Electrical Engineering 663 3 units; H(3-0)
(formerly Electrical Engineering 619.09)

Numerical Electromagnetic Field Computation
Solution techniques for electromagnetic fields: finite difference, finite elements/volumes, boundary elements, finite difference time domain, and moment methods. Practical aspects concerning computer implementation: accuracy, speed, memory, and solvers.

Electrical Engineering 665 3 units; H(3-0)
(formerly Electrical Engineering 619.21)

Bioelectromagnetism
Generation, transmission, and measurement of electromagnetic events generated by excitable cells (heart, brain, muscle). Topics cover the scale from membrane and cell dynamics to tissue behaviour and body surface recordings.

Electrical Engineering 667 3 units; H(3-0)
(formerly Electrical Engineering 619.25)

Intelligent Control
Application of machine learning algorithms in control systems: neural networks, fuzzy logic, the cerebellar model arithmetic computer, genetic algorithms; stability of learning algorithms in closed-loop non-linear control applications.

Prerequisite(s): At least one undergraduate level course in control systems.

Electrical Engineering 669 3 units; H(3-0)
(formerly Electrical Engineering 619.52)

Renewable Energy and Solid State Lighting for the Developing World
History of Lighting, Illumination Measurements and Standards - Incandescent, Fluorescent, LEDs and OLEDs. Generation using Hydro, Solar, Photovoltaic, Wind, Thermoelectric, Biomass, Thermal. Energy Storage and Supply Chains. System Design, Analysis and Life Cycle Assessment. Kyoto Protocol, Carbon Credits and Trading.

Electrical Engineering 671 3 units; H(3-0)

Adaptive Signal Processing
Fundamentals: Performance objectives, optimal filtering and estimation, the Wiener solution, orthogonality principle. Adaptation algorithms: MSE performance surface, gradient search methods, the Widrow-Hoff LMS algorithm, convergence speed and misadjustment. Advanced techniques: recursive least-squares algorithms, gradient and least-squares multiple filter, frequency domain algorithms, adaptive pole-zero filters. Applications: system identification, channel equalization, echo cancellation, linear prediction, noise cancellation, speech.

Electrical Engineering 673 3 units; H(3-0)

Wireless Communications Engineering
The basics of mobile radio telephone: mobile telephone frequency channels, components of mobile radio, objectives of mobile telephone systems, major problems and tools available. The mobile radio environment: fading and propagation loss, propagation loss prediction, channel and signal models, fading statistics, classification of fading channels. Methods of reducing fading effects: diversity techniques and diversity combining methods. Signaling over fading channels. Frequency reuse schemes: cellular concept, mobile radio interference, FDMA, TDMA, and spread spectrum techniques. Portable systems, air-to-ground systems, and land mobile/satellite systems, processing.

Prerequisite(s): Electrical Engineering 571.

Electrical Engineering 675 3 units; H(3-0)

Digital Communications
Physical layer digital communications. Linear modulation and demodulation using signal space concepts. Optimal and sub-optimal detection of symbols and sequences. Pulse shaping and spectral analysis. Wireless propagation and system design. Error correction using channel codes. Advanced techniques for high speed communications.

Prerequisite(s): Electrical Engineering 571.

Electrical Engineering 677 3 units; H(3-0)

Information Theory Applied to Digital Communications
Understanding of the digital communication link in a noisy channel with distortion. Fundamentals of information theory applicable to the statistical signal processing of digital communication receivers, presented in-depth that will provide insights into optimum receiver architecture, processing and error coding. Capacity analysis of SISO and MIMO multiple antenna communication systems as well as other forms of diversity, derived within the framework of information theory.

Prerequisite(s): Electrical Engineering 675.

Electrical Engineering 679 3 units; H(3-0)
(formerly Electrical Engineering 619.60)

Digital Video Processing
Fundamentals of digital video representation, filtering and compression, including popular algorithms for 2-D and 3-D motion estimation, object tracking, frame rate conversion, deinterlacing, image enhancement, and the emerging international standards for image and video compression, with such applications as digital TV, web-based multimedia, videoconferencing, videophone and mobile image communications.

Prerequisite(s): At least one undergraduate level course in Signal Processing.

Electrical Engineering 681 3 units; H(3-0)
(formerly Electrical Engineering 619.76 and 619.82)

VLSI and SOC
Timing and power models; Issues in BIST for SOC; System and Circuit Optimization for SOC applications using compiler techniques; System-on-a-chip design methodology; Topics in Architectural low-power techniques; Design methodology for embedded architectures; Advanced architectures for image/video/speech/audio/Internet/wireless applications; Topics in algorithm/architecture design under timing and throughput constraints.

Prerequisite(s): At least one undergraduate level course in Microelectronics or VLSI.

Electrical Engineering 683 3 units; H(3-0)
(formerly Electrical Engineering 619.19)

Algorithms for VLSI Physical Design Automation
Aspects of physical design including: VLSI design cycle, fabrication processes for VLSI devices, basic data structures and algorithms, partitioning, floor planning, placement and routing.

Electrical Engineering 685 3 units; H(3-1)
(formerly Electrical Engineering 619.64)

Software Defined Radio Systems
Advanced design aspects related to the design of Software Defined Radio (SDR) systems applicable to wireless and satellite communication systems. System level modelling and baseband design aspects of SDR systems. Transmitter and receiver architectures appropriate for SDR transceivers. Multi-band transmitters, sub-sampling receivers and six-port based receivers. Design strategies and calibration techniques for SDR systems.

Prerequisite(s): Electrical Engineering 574 or the consent of the instructor.

Antirequisite(s): Credit for Electrical Engineering 641 and 619.64 will not be allowed.

Electrical Engineering 687 3 units; H(3-0)

Switch Mode Power Converters
Design and analysis of dc-to-dc and ac-to-ac single-phase power converters. Device characteristics. Dc-to-dc topologies, dc-to-ac topologies and ac-to-ac topologies. Linearized models. Classical feedback control; introduction to state-space analysis methods. Input harmonic analysis, output harmonic analysis, and techniques to obtain unity input power factory.

Electrical Engineering 691 3 units; H(3-0)

Integrated Micro and Nanotechnology Sensory Systems
Integrated circuits for sensing. The physical process of sensing photons and ions. The circuitry of signal amplification. Considerations for integrated circuit implementation. Solid state sensors and development in CMOS technology. Analog to Digital conversion in sensory arrays. Technology scaling and impact. Low voltage and implications regarding signal processing. Other types of sensors such as pH sensing. MEMS technology and applications. Integrated Light sources. System examples.

Antirequisite(s): Credit for Electrical Engineering 691 and 619.26 will not be allowed.

Electrical Engineering 693 3 units; H(3-0)

Restructured Electricity Markets
Market design and auction mechanisms, role of independent system operator (ISO) in different markets, generation scheduling in deregulation, transmission operation and pricing. Transmission rights, procurement and pricing ancillary services, system security in deregulation, and resource management in a market environment.

Antirequisite(s): Credit for Electrical Engineering 693 and 619.98 will not be allowed.

Electrical Engineering 695 3 units; H(3-1T)

Applied Mathematics for Electrical Engineers
Understanding of vector spaces and function spaces; eigenvalues and eigenvectors in both the linear algebraic and differential equation sense; special functions in mathematics; advanced methods for solutions of differential equations.

Prerequisite(s): Electrical Engineering 327.

Antirequisite(s): Credit for Electrical Engineering 695 and either 519.42 or 619.95 will not be allowed.

Electrical Engineering 697 3 units; H(3-2)

Digital Image Processing
Image formation and visual perceptual processing. Digital image representation. Two dimensional Fourier transform analysis. Image enhancement and restoration. Selected topics from: image reconstruction from projections; image segmentation and analysis; image coding for data compression and transmission; introduction to image understanding and computer vision. Case studies from current applications and research.

Prerequisite(s): Electrical Engineering 327.

Electrical Engineering 698 6 units; F(0-4)

Graduate Project
Individual project in the student's area of specialization under the guidance of the student's supervisor.

Note: Open only to students in the MEng Courses Only Route.

Electrical Engineering 699 3 units; H(3-0)

Multidimensional Signal Processing
Characterization of multidimensional (MD) signals, the MD Laplace, Fourier and Z transforms. Practical analog and digital signals and their MD energy density spectra. Aliasing, convolution, boundary conditions, causality, and stability in MD. Characterization of linear shift-invariant systems using MD transform transfer functions. State variable representations of MD systems. Elementary decompositions of MD transfer functions and bounded-input bounded-output stability. Design and implementation of MD digital filters. Applications of MD signal processing in engineering systems. Two- and three-dimensional digital signal processing in seismic, sonar, imaging and broadcast television.

Energy and Environment, Engineering ENEE

Instruction offered by members of the Schulich School of Engineering.

Senior Courses

Energy and Environment, Engineering 355 3 units; H(3-2T)

Introduction to Energy and the Environment
History of energy technologies, energetics of natural systems and agriculture, formation, extraction, and transformations of fossil fuels, renewables such as biomass, solar and wind; and the electricity system, environmental impacts of energy systems, technical options for transforming energy systems to reduce environmental impacts.

Prerequisite(s): Admission to the Energy Management Concentration (Haskayne School of Business) or the Engineering Energy and Environment Specialization (Schulich School of Engineering) or the Energy Sciences Concentration (Faculty of Science).

Energy and Environment, Engineering 501 3 units; H(3-1T)

Pollution Prevention and Control for Energy Industry
An overview of environmental laws and regulations. Environmental standards for air quality, water and land. Regulatory approval process for new energy projects. Base-Line Study and Environmental Impact Assessment. Environmental review of new energy projects. Pollution prevention methodology and techniques. Separation and recycle streams. Process modification, integration, analysis and control. Risk assessment.

Prerequisite(s): Third-year standing, or higher, in the Schulich School of Engineering, and Engineering 311.

Energy and Environment, Engineering 503 3 units; H(3-1T)

Life Cycle Assessment
Concepts of life cycle analysis. Applications to energy utilization, environmental consequences, sustainable development, environmental process analysis, and optimization. Inventory, impact and improvement analyses of energy systems. LCA Model development and utilization. Human health and safety considerations.

Prerequisite(s): Third-year standing, or higher, in the Schulich School of Engineering, and Engineering 311.

Energy and Environment, Engineering 505 3 units; H(3-1T)

Effluent Treatment Processes for Energy Industry
Application of fundamental engineering concepts to develop process design specifications for various unit operations and separation processes used for the treatment of gaseous (air), aqueous (wastewater) and solid effluents from mining, exploration, production, transportation and utilization of carbon-based energy sources.

Prerequisite(s): Chemical Engineering 331 or Mechanical Engineering 341, as well as third-year standing, or higher, in the Schulich School of Engineering.

Energy and Environment, Engineering 519 3 units; H(3-1T)

Special Topics in Energy and Environment
Current advanced topics in Energy and Environment.

Prerequisite(s): Consent of the CEERE Director or designate, as well as third-year standing, or higher, in the Schulich School of Engineering.

MAY BE REPEATED FOR CREDIT

Energy and Environment, Engineering 573 3 units; H(3-1T)

Engineering Aspects of Sustainable Communities
Ecological footprint, life cycle assessment, sustainable construction, energy efficiency in buildings, intelligent and sustainable transportation, control of water/air pollution from mobile and stationary sources, energy from waste.

Prerequisite(s): Third-year standing, or higher, in the Schulich School of Engineering.

Energy and Environment, Engineering 575 **3 units; H(3-1T)**

Alternative Energy Systems
An overview of alternative energy systems including hydroelectric, wind, solar (thermal, concentrating, and photovoltaic), distributed generation using gas turbines. Energy system performance quantified using thermodynamic, fluid mechanic, and heat transfer analysis.

Prerequisite(s): Engineering 311, as well as, third-year standing, or higher, in the Schulich School of Engineering.

Energy and Environment, Engineering 577 **3 units; H(3-1T)**

Electrical Transmission System Planning and Operation
Electricity markets, carbon markets, optimal operation of electricity systems, environmental impacts of transmission networks, regulatory issues.

Prerequisite(s): Third-year standing, or higher, in the Schulich School of Engineering.

Energy and Environmental Systems EESS

Graduate Courses

Energy and Environmental Systems 601 **3 units; H(3-1T)**

Introduction to Energy and Environmental Systems
The course provides a structured overview to the interactions of energy systems and the environment. The lectures are taught collaboratively by several EESS faculty. The course aims to foster a unified, scientific understanding of energy flows and transformations in industrial society and the natural world; a scientific overview of some of the most important links between energy and environmental systems; and an introduction to the business, legal and regulatory systems that shape the interactions between energy and environment.

Prerequisite(s): Graduate standing in Energy and Environmental Systems specialization or instructor permission.

Energy and Environmental Systems 603 **3 units; H(1-3T)**

Project Course
Projects are applied interdisciplinary problem-solving courses in which students work as leaders or as members of project teams. Most course time is devoted to project management and presentations from students. The project course gives students experience working on weakly-structured, real-world problems that require teamwork and contributions from diverse disciplines. They are co-managed by students and faculty advisors and should be responsive to an external "client" or expert panel. Problem areas are abstracted from local, provincial and national situations and involve the interaction of energy systems, the environment and public policy. Oral and written presentations concerning the results of project studies are required

Prerequisite(s): Graduate standing in Energy and Environmental Systems specialization or instructor permission.

Energy and Environmental Systems 606 **3 units; H(2S-0)**
(formerly Energy and Environmental Systems 605)

Graduate Seminar
The graduate research seminar fosters the development of presentation and communication skills as well as engagement in critical analysis and debate. Course time is primarily research presentations by faculty, research staff and students. All students must present their work.

Prerequisite(s): Graduate standing in Energy and Environmental Systems specialization or instructor permission.

Energy and Environmental Systems 607 **3 units; H(3-0)**

Tools for Systems Analysis
This course provides an introduction to analytical methods and software tools that are most frequently used for research in energy and environmental systems. Analytical methods include risk, uncertainty and decision analysis; an introduction to engineering economics; and an introduction to tools for environmental modelling. Software tools include Excel, and extensions such as Crystalball, general purpose systems such as Matlab and Mathematica; and GIS tools for non-specialists.

Prerequisite(s): Graduate standing in Energy and Environmental Systems specialization or instructor permission.

Energy and Environmental Systems 619 **3 units; H(3-0)**

Special Topics
Students will be provided with the opportunity to focus on advanced studies in specialized topics pertaining to energy system engineering, law, public policy or economics, or a combination of these issues.

Prerequisite(s): Graduate standing in the Energy and Environmental Systems specialization or instructor permission.

MAY BE REPEATED FOR CREDIT

Energy Engineering ENER

Instruction offered by members of Schulich School of Engineering.

Junior Courses

Energy Engineering 200 **3 units; H(3-3)**

Engineering Design and Innovation
An interdisciplinary course involving the application of engineering principles, design innovation tools and sustainability tools, life-cycle assessment, and leadership concepts through a sequence of team-based design projects.

Prerequisite(s): Admission to the BSc Energy Engineering program.

Antirequisite(s): Credit for Energy Engineering 200 and Engineering 200 will not be allowed.

Energy Engineering 240 **3 units; H(4-3)**

Introductory Dynamics for Energy Engineering
Calculus with applications to dynamics. Kinematics of particles undergoing rectilinear and curvilinear motion. Analysis of the kinetics of particles by direct use of Newton's laws of motion, work and energy methods, and impulse and momentum methods.

Prerequisite(s): Admission to the BSc Energy Engineering program.

Energy Engineering 260 **3 units; H(3-2)**

Statics for Energy Engineering
Engineering Statics topics: force vectors; equilibrium of a particle in two and three dimensions; force system resultants; equilibrium of a rigid body in two and three dimensions; trusses; frames and machines. Vector and linear algebra methods and applications to static engineering mechanics.

Prerequisite(s): Admission to the BSc Energy Engineering program.

Senior Courses

Energy Engineering 300 **3 units; H(3-3)**

Engineering Design and Energy Policy
Introduction to the mechanical, petroleum, and energy engineering profession, fundamentals of energy engineering design, testing, and product development; problem solving skills development; oil and gas standards, intellectual property protection, project management; regulatory issues; public policy. Case studies and projects may be drawn from a range of energy engineering areas.

Prerequisite(s): Energy Engineering 200 and admission to the BSc Energy Engineering program.

Energy Engineering 340 **3 units; H(3-3)**

Dynamics for Energy Engineering I
Systems of particles. Kinematics of rigid bodies. Rotation and translation. Torque and angular momentum. Moment of inertia. Two-dimensional dynamics of rigid bodies. First-order ordinary differential equations. Integrating factor. Separable and exact equations. Second-order ordinary differential equations. Characteristic equation and variation of parameters method. Series solutions of ordinary differential equations.

Prerequisite(s): Energy Engineering 240 and admission to the BSc Energy Engineering program.

Energy Engineering 350 **3 units; H(3-3)**

Computing Tools for Energy Engineers
The application of computer tools to solve practical Energy Engineering problems; fundamentals of engineering computing including algorithm development, selection of appropriate tools, documentation of solutions, and verification and interpretation of results; applications using engineering analysis and spreadsheet tools; fundamentals of engineering graphics and computer aided design including technical drawing conventions used in the energy industry, dimensioning and tolerances; applications using Computer-Aided Design (CAD) software.

Prerequisite(s): Admission to the BSc Energy Engineering program.

Energy Engineering 360 **3 units; H(3-2)**

Mechanics of Materials for Energy Engineering
Internal forces in trusses, beams, shafts, frames and machines. Axial-force, shear-force, bending-moment and internal-torque diagrams. The concept of stress. Normal and shear components in a co-ordinate system. The concept of strain and its components. Stress-strain relations. Elasticity. Hooke's law and its generalisation. Stress and deformation of uniaxially loaded members. Stress and deformation in the torsion of shafts of a circular cross section. Stress and deformation in transversely loaded beams of a symmetric cross section. General analysis of plane stress. Principal stresses. Mohr's circle. Stress in structures subjected to combine loading.

Prerequisite(s): Energy Engineering 240, 260 and admission to the BSc Energy Engineering program.

Energy Engineering 400 **3 units; H(3-3)**

Engineering Design and Economics
Design of chemical and oil & gas processing units and plants; cost estimates and chemical process economics; identifying market needs and commercialization considerations; Safety and environmental considerations in process design; critical thinking and problem solving skills development; case studies and projects may be drawn from a range of energy engineering areas.

Prerequisite(s): Energy Engineering 300 and admission to the BSc Energy Engineering program.

Energy Engineering 425 **3 units; H(3-1T-2)**

Electricity, Magnetism and Electrical Circuits
Electric charges and electric current; Ohm's Law, Kirchhoff's Laws, application to simple circuits; Definitions of electric and magnetic fields. Introduction to circuit theory: DC circuits, amplifiers, operational amplifiers, single and three phase AC circuits. Introduction to basic electronic devices.

Prerequisite(s): Energy Engineering 240 and 260 and admission to the BSc Energy Engineering program.

Energy Engineering 460 **3 units; H(3-1T)**

Dynamics for Energy Engineering II
Planar kinematics and kinetics of rigid bodies; work, energy, impulse and momentum of rigid bodies; kinematics, statics, and dynamics of planar mechanisms; design of cams, gears, and gear trains.

Prerequisite(s): Energy Engineering 240 and 260 and admission to the BSc Energy Engineering program.

Energy Engineering 480 **3 units; H(3-1T-3/2)**

Energy Engineering Fluid Mechanics
Basic principles of mechanics of fluids; properties of fluids; fluids at rest; manometers and other pressure measuring devices; dimensional analysis; the laws of conservation of mass and momentum; Bernoulli's equation for incompressible flow and the energy equation; flow measurements; elementary pipe flow problems including losses, pumps, etc.; applications to a variety of problems in energy engineering.

Prerequisite(s): Engineering 201 and Energy Engineering 340 and admission to the BSc Energy Engineering program.

Energy Engineering 560 **3 units; H(3-2)**

Energy Engineering Thermodynamics
Review of the principles of the first and second law of thermodynamics; application to the properties of fluids and solutions; vapour liquid equilibria; engine gas cycles including simple gas turbines; gas turbines with reheat, intercooling and heat exchange. Reciprocating air compressors and expanders. Applications of humidity considerations; heat-pump and refrigeration cycles and their performance criteria. Combustion processes, chemical equilibrium, dissociation.

Prerequisite(s): Engineering 311 and admission to the BSc Energy Engineering program.

Energy Engineering 570 **3 units; H(3-1T-3/2)**

Automation and Controls
Linear systems and their characteristics; the Laplace transform, block diagram manipulation, frequency response, application to first and second order physical systems; analysis and design of sensors and actuators; industrial automation systems, programmable logic controllers (PLC), supervisory control and data acquisition (SCADA) systems, distributed control systems (DCS).

Prerequisite(s): Energy Engineering 340 and Energy Engineering 425 and admission to the BSc Energy Engineering program.

Energy Management ENMG

Instruction and services offered by members of the Haskayne School of Business

Senior Courses

Energy Management 301 **3 units; H(3-0)**

Canadian Energy Management and Regulation
An examination of energy development in Canada and the business, law and policy issues arising from the development of different energy sources (conventional oil and gas, oil sands, coal, nuclear, electricity and renewable energy sources).

Prerequisite(s): Admission to the Energy Management Concentration (Haskayne School of Business) or the Engineering Energy and Environment specialization (Schulich School of Engineering) or the Energy Sciences Concentration (Faculty of Science).

Energy Management 403 **3 units; H(3-0)**
(formerly Energy Management 303)

Overview of the Alberta Oil and Gas Industry
Provides an understanding of the upstream petroleum industry and will focus on the development of petroleum resources by Alberta-based corporations. Analysis of shale gas and oil development will be included.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Energy Management 301.

Energy Management 485 **3 units; H(3-0)**

Oil and Gas Marketing
Practical introduction to crude oil (light and heavy) and natural gas marketing. Marketing of refined oil products and retail gasoline are not covered.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Energy Management 487 **3 units; H(3-0)**

Energy Risk Management
Provides an overview of key issues related to energy risk management. Some of the key topics to be addressed are: managing pricing risks associated with changing market conditions and deregulation; tools used to manage volatility, including futures and options for energy risk management; environmental risk management, and risk financing for the energy sector.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Energy Management 489 **3 units; H(3-0)**

International Energy Development
A focus on international energy development, energy contracts, sustainable development, and the management of environmental and corporate social responsibility issues.

Prerequisite(s): Admission to the Haskayne School of Business and Business and Environment 395.

Engineering ENGG

Instruction offered by members of Schulich School of Engineering.

Junior Courses

Engineering 200 **3 units; H(3-3)**

Engineering Design and Communication
An interdisciplinary course involving the application of engineering principles, design, communications, leadership and project management concepts through a sequence of team-based design projects.

Antirequisite(s): Credit for Engineering 200 and any of Engineering 251, 253 or Energy Engineering 200 will not be allowed.

Engineering 201 **3 units; H(3-1.5T-3/2)**

Behaviour of Liquids, Gases and Solids
An introduction to the behaviour of fluids and solids; phase transformations, the phase rule and phase diagrams. Ideal and real gases; equations of state and their engineering applications; simple kinetic theory; transport properties of fluids. Liquid state; vapor pressure; shear behaviour; flow of fluids in pipelines. Solids; crystalline and non-crystalline structure; non-equilibrium solid phases; electrical and thermal conductivity; dislocations; stress and strain; creep; fracture.

Engineering 202 **3 units; H(3-1.5T)**

Engineering Statics
Force vectors; equilibrium of a particle in two and three dimensions; force system resultants; equilibrium of a rigid body in two and three dimensions; internal forces in trusses; frames, machines and beams; bending moment and shear force diagrams; friction; centre of gravity; centroids of areas; composite bodies.

Antirequisite(s): Credit for Engineering 202 and either Engineering 203 or 205 will not be allowed.

Engineering 209 **3 units; H(3-1T)**
(Economics 209)

Engineering Economics
The basic tools and methodology of engineering economic studies. Topics include investment decisions, theory of replacement, economies of scale, externalities, social decision making and government regulation. Examples are drawn from engineering projects.

Prerequisite(s): Registration in the Faculty of Engineering with second-year standing or higher. If not registered in the Schulich School of Engineering, consent of the Department of Economics. If required for APEGA, consent of the Schulich Undergraduate Studies Office.

Engineering 225 **3 units; H(4-3/2)**

Fundamentals of Electrical Circuits and Machines
Current, voltage and power; Kirchhoff's current and voltage laws; capacitors; electricity and magnetism fundamentals applied to circuit elements and machines; inductors; topics in electrical circuits and systems; instrumentation; circuit design, DC and AC circuit analysis methods; DC and AC machines; first order circuits and transient analysis.

Antirequisite(s): Credit for Engineering 225 and any of Engineering 325, Biomedical Engineering 327 or Electrical Engineering 341 will not be allowed.

Engineering 233 **3 units; H(3-2)**

Computing for Engineers
Overview of computer systems. Functions of software components: operating systems, editors, compilers. Programming in a high-level language: selection and loop structures, routines, array and record types, text file operations. Introduction to object-based programming: use of class libraries and construction of simple classes.

Antirequisite(s): Credit for Engineering 233 and any of Computer Science 217, 231, 235, or Computer Engineering 339 will not be allowed.

Senior Courses

Engineering 311 **3 units; H(3-1.5T-3/2)**

Engineering Thermodynamics
Energy, thermodynamic systems, properties and state, temperature and the zeroth law, equilibrium, properties of the pure substance, equations of state. Work, reversibility, heat, first law, specific heats, enthalpy, ideal gas, flow systems. Entropy and the second law, Carnot cycle, thermodynamic temperature scale, process efficiencies, cycles, calculation of entropy change, exergy analysis.

Prerequisite(s): Engineering 201 and Mathematics 275 or Applied Mathematics 217 or Energy Engineering 240.

Engineering 317 **3 units; H(3-1.5T-3/2)**

Mechanics of Solids
Axial-force, shear-force and bending moment diagrams; stress and strain; stress-strain relations; elastic and plastic behaviour; elastic constants; simple statically indeterminate (one-degree) problems; review of moment of inertia, product of inertia and principal axes of inertia; elastic torsion of circular shafts; elastic and plastic bending about principal axes of beams with symmetrical cross-section; composite beams; shear stresses due to bending; Mohr's circle for stress; thin-walled pressure vessels; deflection of beams by integration; Euler buckling.

Prerequisite(s): Engineering 202 and Mathematics 275 or Applied Mathematics 217.

Engineering 319 **3 units; H(3-1.5T)**

Probability and Statistics for Engineers
Presentation and description of data, introduction to probability theory, Bayes' theorem, discrete and continuous probability distributions, estimation, sampling distributions, tests of hypotheses on means, variances and proportions, simple linear regression and correlation. Applications are chosen from engineering practice.

Prerequisite(s): Mathematics 277 or Applied Mathematics 219 or Energy Engineering 240.

Antirequisite(s): Credit for Engineering 319 and Biomedical Engineering 319 will not be allowed.

Note: Credit towards degree requirements will be given for only one of Engineering 319, Political Science 399, Psychology 312, Sociology 311, Statistics 205, 213 and 217, 327; that one being a course(s) appropriate to the particular degree program.

Engineering 349 **3 units; H(3-1.5T)**

Dynamics
Kinematics of a particle. Newton's laws of motion. Conservation of angular momentum. Work done by friction. Conservation of energy. Conservation of momentum. Impulse and momentum. Kinematics of rigid bodies. Translation and rotation. Two-dimensional dynamics of rigid bodies.

Prerequisite(s): Engineering 202; and Mathematics 275 or Applied Mathematics 217; and Mathematics 277 or Applied Mathematics 219.

Engineering 391 **1.5 units; Q(1.5-0)**

Advanced Topics I
Special topics in engineering and engineering complementary studies.

Prerequisite(s): Consent of the Associate Dean (Academic & Planning).

MAY BE REPEATED FOR CREDIT

Engineering 393 **3 units; H(3-0)**

Advanced Topics II
Special topics in engineering and engineering complementary studies.

Prerequisite(s): Consent of the Associate Dean (Academic & Planning).

MAY BE REPEATED FOR CREDIT

Engineering 407 **3 units; H(3-2T)**

Numerical Methods in Engineering
The theory and use of numerical computational procedures to solve engineering problems. Methods for: solution of non-linear equations, solution of simultaneous linear equations, curve fitting, solution of the algebraic eigenvalue problem, interpolation, differentiation, integration, solution of ordinary differential equations and solution of partial differential equations are included. The tutorial includes the application to elementary problems and the computer solution of comprehensive engineering problems.

Prerequisite(s): Engineering 233 and Mathematics 375 or Applied Mathematics 307.

Engineering 481 **3 units; H(3-1.5S)**

Technology and Society
An interpretive course on the interrelationship between technology and society. The first part of the course surveys significant historical developments within disciplinary areas such as energy, materials, production processes, structures, transport, communications, and computation. Sequence within each area: discovery, development, application, impact, future. Social and economic consequences are also considered. The latter part of the course explores contemporary problems of society and technology.

Note: Available to students registered in other faculties as well as third-year or fourth-year Engineering students. This course does not presuppose any formal background in Engineering or Science.

Engineering 501 **3 units; H(0-4)**

Senior Capstone Design Project I
A team-based design course in which students apply the knowledge and skills acquired in earlier courses while refining their skills in teamwork and project management. Students work towards innovative, entrepreneurial solutions to industry-sponsored design projects, and engage in individual critical reflection on their course activities, team performance, and on their growth as an engineering designer within their undergraduate program.

Prerequisite(s): Fourth year standing or above.

Engineering 502 **3 units; H(0-4)**

Senior Capstone Design Project II
A continuation of the capstone design project, where student teams build on their design work in Part I.

Prerequisite(s): Engineering 501.

Note: Engineering 501 and 502 are a required two-course sequence that shall be completed in the same academic year.

Engineering 513 **3 units; H(3-0)**

The Role and Responsibilities of the Professional Engineer in Society
The professional duties and responsibilities of the engineer as they relate to society. Ethics and the engineering profession. Public and worker safety and health. Design for safety. Sustainable development. The engineer and the environment. Environmental stewardship. Essentials of leadership. Gender issues. Employment equity. Fundamentals of Engineering Law. Professional organizations. The Engineering Professions Act.

Engineering 515 **3 units; H(3-2T)**

Project Management for Engineers
Covers the application of project management principles such as planning, scope development, design, procurement, construction, commissioning and start-up to engineering projects. Class reviews aspects of a current major engineering projects and case studies.

Prerequisite(s): Consent of the student's department.

Engineering 517 **3 units; H(3-0)**

Engineering Safety
Introduction to Professional Responsibility, Risk Management and Identification, Process Safety Management, Incident Investigation and Reporting; Engineering Ethics and Public Safety; Key national safety codes, standards and regulations, Business case for safety, and common best practices, fundamentals of Crisis and Emergency Management, change management to successful incorporate safety into teams and the design process; Engineering Discipline specific Engineering Safety Management including Electrical Safety, Chemical Safety, Fire, Dust Hazard and Explosions, and Biological Risks.

Prerequisite(s): Consent of the student's department.

Engineering 519 **3 units; H(3-2) or H(3-0)**

Special Topics in Engineering
Current topics in Engineering.

Prerequisite(s): Consent of the student's department.

MAY BE REPEATED FOR CREDIT

Engineering 599 **3 units; H(0-6)**

Individual Engineering Project
Individual work on an assigned Engineering project under the supervision of a faculty member. The project will normally involve a literature review, theoretical work, and laboratory or field work. Engineering Communications, including written reports, logbooks and oral presentations.

Prerequisite(s): Formal approvals from the project supervisor and the student's department.

Graduate Courses

Engineering 601 **1.5 units; Q(1.5-0)**

Professional Development I
Topics covered include: health and safety, communication styles, supervisory relationships and respect in the lab, presentation skills including presentation planning and voice projection, reference gathering and management, awareness of plagiarism, and writing abstracts.

NOT INCLUDED IN GPA

Engineering 603 **1.5 units; Q(1.5-0)**

Professional Development II
Topics covered include: presentation skills, skills for writing scientific manuscripts, peer review pro-

cess, defense and candidacy, engineering design, intellectual property, and networking basics.

NOT INCLUDED IN GPA

English ENGL

Instruction offered by members of the Department of English in the Faculty of Arts.

The following 300-level courses have no 200-level prerequisites: English 311, 317, 351, 353, 355, 371, 372, 382, 383, 384, 385, 387, 388, 389, 391, 393, 395, 396, 399.

Junior Courses

English 201 **3 units; H(3-0)**

Approaches to Literature
Selected works of poetry, prose, and/or drama. Emphasizes fundamental skills: how to read a text accurately and critically; how to write logically, clearly, and persuasively. Individual sections may vary in the choice of genre and theme.

Antirequisite(s): English 203.

Note: English Majors begin their studies with English 203 and 205.

English 203 **3 units; H(3-0)**

Foundations: Literary Analysis
A seminar on a special topic, emphasizing critical reading and writing. This course prepares students for advanced undergraduate studies in English.

Antirequisite(s): English 201.

Note: Compulsory for, and limited to, English Majors. Please consult the Department of English website for the area of focus for each section of this course.

English 205 **3 units; H(1.5-1.5S)**

Foundations: Shakespeare
Selected works of William Shakespeare, with instruction in critical writing.

Antirequisite(s): Credit for English 205 and either 311 or 312 will not be allowed.

Note: Compulsory for English Majors and open to other interested students.

English 265 **3 units; H(1.5-1.5S)**

Introductory Creative Writing
Instruction in the rudiments of craft for poetry, scripts, and fiction, emphasizing the centrality of reading and revision to literary composition.

Note: Does not count toward the "Creative Writing concentration" transcript designation. Primarily intended for students planning to take further courses in Creative Writing.

Senior Courses

English 302 **6 units; F(1.5-1.5S)**

Foundations: Introduction to Contemporary Theoretical Practices
An examination of the claims and assumptions of a range of contemporary critical practices, such as formalism, structuralism, deconstruction, feminism and gender studies, new historicism, psychoanalytic criticism, and cultural and ideological critique. Includes practice in the application of theory to literary texts.

Prerequisite(s): 6 units of English and/or Comparative Literature.

Note: Compulsory for English Majors, Minors and Honours students.

English 311 **3 units; H(3-0)**

Shakespeare
A consideration of the development and variety of work by William Shakespeare.

Antirequisite(s): Credit for English 311 and either 205 or 312 will not be allowed.

English 317 **3 units; H(3-0)**

Women's Literary Tradition
A survey of writings by women in English from the medieval period to the present, with emphasis on the evolution of a complex and varied literary tradition.

Antirequisite(s): Credit for English 317 and 318 will not be allowed.

English 340 **6 units; F(1.5-1.5S)**

Foundations: Literature in English from the Middle Ages to the Present
A historical survey.

Prerequisite(s): 6 units of English and/or Comparative Literature.

Antirequisite(s): Credit for English 340 and 240 will not be allowed.

Note: Compulsory for English Majors, Minors and Honours students.

English 351 **3 units; H(3-0)**

Poetry: Reading and Analysis
A study of poetic forms in English from a wide range of historical periods, social contexts, and national literatures. Through textual analysis and close reading, this course acquaints students with the characteristic techniques of prosody and basic poetic terminology, giving detailed attention to tropes and figures along with other poetic concepts such as form, tone, diction, implication, and point of view.

Antirequisite(s): Credit for English 351 and 354 will not be allowed.

Note: This course cannot be used by Majors or Honours students to fulfill historical breadth requirements.

English 353 **3 units; H(3-0)**

Drama: Reading and Analysis
A study of dramatic literature in English from a wide range of historical periods, social contexts, and national literatures. Through textual analysis and close reading, this course acquaints students with the characteristic techniques of dramaturgy and basic theatric terminology, giving detailed attention to the formal conventions of literature written to be performed on stage.

Antirequisite(s): Credit for English 353 and 356 will not be allowed.

Note: This course cannot be used by Majors or Honours students to fulfill historical breadth requirements.

English 355 **3 units; H(3-0)**

Studies in Prose Fiction: Special Topic
A study of prose fiction from a formalist, historical, or thematic perspective.

Antirequisite(s): Credit for English 355 and 358 will not be allowed.

MAY BE REPEATED FOR CREDIT

English 364 **6 units; F(3-0)**

Poetry Writing I
Basic instruction in writing poetry, with particular emphasis on the short poem.

Prerequisite(s): Consent of the Department.

Note: One month before the start of classes, prospective students must submit a portfolio of their own work for evaluation before consent of the Department will be given. Details of this procedure are available from the Department of English. (This course is ideal preparation for English 494.)

English 366 **6 units; F(3-0)**

Fiction Writing I
Basic instruction in the art of fiction writing, with particular emphasis on the short story.

Prerequisite(s): Consent of the Department.

Note: One month before the start of classes, prospective students must submit a portfolio of their own work for evaluation before consent of the Department will be given. Details of this procedure are available from the Department of English. (This course is ideal preparation for English 496).

English 371 **3 units; H(3-0)**

Topic in Canadian Literature
MAY BE REPEATED FOR CREDIT

English 372 **3 units; H(3-0)**

Fundamentals of Canadian Literature
This course provides a broad historical survey of Canadian writing from its origins up to the work of living writers. The course introduces students to some of the major authors in Canada, as well as to significant critical and cultural ideas that have developed about this nation's literature. Majors and Honours students in English are strongly encouraged (although not required) to take this specific course in fulfillment of the Canadian component for their degree requirements.

Antirequisite(s): Credit for English 372 and 370 will not be allowed.

English 381 (Linguistics 381) **3 units; H(3-0)**

The History of English
An introduction to important changes and stages in the history of English including its Indo-European and Germanic origins and a consideration of Modern English grammar and orthography from a historical perspective.

Prerequisite(s): Linguistics 201.

English 382 **3 units; H(3-0)**

Topic in American Literature
MAY BE REPEATED FOR CREDIT

English 383 **3 units; H(3-0)**

Topic in Literature and the Environment
Antirequisite(s): Credit for English 383 and either 387.03 or 387.30 will not be allowed.

MAY BE REPEATED FOR CREDIT

English 384 **3 units; H(3-0)**

Topic in Women's Literatures
MAY BE REPEATED FOR CREDIT

English 385 **3 units; H(3-0)**

Topic in Aboriginal Literatures
MAY BE REPEATED FOR CREDIT

English 387 **3 units; H(3-0)**

Topic in Literature and Society
MAY BE REPEATED FOR CREDIT

English 388 **3 units; H(3-0)**

Topic in Popular Genres
MAY BE REPEATED FOR CREDIT

English 389 **3 units; H(3-0)**

Topic in Gay or Lesbian Literature
MAY BE REPEATED FOR CREDIT

English 391 **3 units; H(3-0)**

Topic in Postcolonial Literature and Theory
MAY BE REPEATED FOR CREDIT

English 393 **3 units; H(3-0)**

Speculative Fiction I: Science Fiction
An examination of works of science fiction.

English 395 **3 units; H(3-0)**

Speculative Fiction II: Fantasy
An examination of works of fantasy.

English 396 **3 units; H(3-0)**

Children's and Young Adult Literature
A historical and critical study of children's and young adult literature.

Antirequisite(s): Credit for English 396 and 398 will not be allowed.

English 399 **3 units; H(3-0)**

Detective Fiction
An examination of detective fiction.

English 401 **3 units; H(3-0)**

Old English Language and Prose Literature
A study of the language of the Anglo-Saxons through reading of prose texts.

Prerequisite(s): English 302 and one of 240 or 340.

English 403 **3 units; H(3-0)**

Old English Poetry
Reading and analysis of Old English poetry in the original language.

Prerequisite(s): English 401.

English 405 **3 units; H(3-0)**

Middle English Literature: The Canterbury Tales
A survey of the Middle English language and the social, cultural and historical contexts of later medieval literature through Geoffrey Chaucer's Canterbury Tales.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 405 and 404 will not be allowed.

English 406 **3 units; H(3-0)**

Middle English Literature: Selected Works
A study of selected works of Middle English poetry, prose, and drama (read in the original language), excluding Chaucer's Canterbury Tales.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 406 and 404 will not be allowed.

English 409 **3 units; H(3-0)**

Early Tudor Literature
A survey of literature from 1485 to 1558, including work by such writers as Henry Howard (Earl of Surrey), Thomas More, and Thomas Wyatt.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 409 and 408 will not be allowed.

English 410 **3 units; H(3-0)**

Elizabethan Poetry and Prose
A survey of non-dramatic literature from 1558 to 1603, including work by such writers as Sir Philip Sidney, Edmund Spenser, and William Shakespeare.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 410 and 408 will not be allowed.

English 411 **3 units; H(3-0)**

Seventeenth-Century Poetry and Prose
A survey of non-dramatic literature of the seventeenth century, including Milton.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 411 and 414 will not be allowed.

English 412 **3 units; H(3-0)**

Elizabethan Drama
A survey of drama from 1558 to 1603, including works by William Shakespeare and Christopher Marlowe.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 412 and 414 will not be allowed.

English 413 **3 units; H(3-0)**

Seventeenth-Century Drama
A survey of drama from 1603 to 1660, including William Shakespeare and Ben Jonson.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 413 and 414 will not be allowed.

English 431 **3 units; H(3-0)**

Literature of the Restoration
A survey of literature from the Restoration of Charles II in 1660 until 1700. Students will read poetry, prose, and drama by Aphra Behn, John Dryden, and such writers as Mary Astell, William Congreve, John Locke, and the Earl of Rochester.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 431 and 430 will not be allowed.

English 433 **3 units; H(3-0)**

Literature of the Early Eighteenth-Century
A survey of literature from 1700 to 1740. Students will read poetry, prose, and drama by Lady Mary Wortley Montagu, Alexander Pope, Jonathan Swift, and such writers as Daniel Defoe, John Gay, and Eliza Haywood.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 433 and 430 will not be allowed.

English 435 **3 units; H(3-0)**

Literature of the Later Eighteenth Century
A survey of literature from 1740 to 1789. Students will read poetry, prose, and drama by Frances Burney, Samuel Johnson, and such writers as Thomas Gray, R. B. Sheridan, and Laurence Sterne.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 435 and 430 will not be allowed.

English 441 **3 units; H(3-0)**

Literature of the Romantic Period: The Age of Revolution
A survey of poetry, prose, and drama by the first generation of Romantic-period writers, including such writers as Joanna Baillie, William Blake, Samuel Taylor Coleridge, Mary Wollstonecraft, and William Wordsworth.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 441 and 440 will not be allowed.

English 443 **3 units; H(3-0)**

Literature of the Romantic Period: The Age of Reform
A survey of poetry, prose, and drama by the second generation of Romantic-period writers, including such writers as Jane Austen, Lord Byron, Felicia Hemans, John Keats, Percy Bysshe Shelley, and Mary Shelley.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 443 and 440 will not be allowed.

English 445 **3 units; H(3-0)**

Literature of the Early Victorian Period
A survey of poetry, prose, and drama by such writers as Charlotte and Emily Brontë, Robert Browning, Thomas Carlyle, Elizabeth Gaskell, Alfred Tennyson, and William Makepeace Thackeray.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 445 and 444 will not be allowed.

English 447 **3 units; H(3-0)**

Literature of the Mid-Victorian Period
A survey of poetry, prose, and drama by such writers as Matthew Arnold, Charles Dickens, George Eliot (Mary Ann Evans), John Stuart Mill, Christina Rossetti, and John Ruskin.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 447 and 444 will not be allowed.

English 449 **3 units; H(3-0)**

Literature of the Late Victorian Period
A survey of poetry, prose, and drama by such writers as Thomas Hardy, Oscar Wilde, Robert Louis Stevenson, Rudyard Kipling, George Bernard Shaw, and Vernon Lee (Violet Paget).

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 449 and 444 will not be allowed.

English 451 **3 units; H(3-0)**

British Literature from 1900 to 1950
A survey of British literature from the first half of the twentieth century.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 451 and 450 will not be allowed.

English 453 **3 units; H(3-0)**

British Literature since 1950
A survey of British literature from the last half of the twentieth century to the present.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 453 and 450 will not be allowed.

English 461 **3 units; H(3-0)**

Early American Literature and the American Renaissance
A survey of American literature from its origins to the Civil War. This course will examine both canonical and newly relevant works of literature and place them in a cultural and critical context.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 461 and 446 will not be allowed.

English 463 **3 units; H(3-0)**

American Literature from the Late 1800s to the Mid-1900s
A survey of American literature from the Civil War to World War II, encompassing realism, naturalism, and modernism. This course will examine both canonical and newly relevant works of literature and place them in a cultural and critical context.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 463 and 446 will not be allowed.

English 465 **3 units; H(3-0)**

American Literature since the Mid-1900s
A survey of American literature since World War II. This course will examine both canonical and newly relevant works of literature and place them in a cultural and critical context.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 465 and 462 will not be allowed.

English 471 **3 units; H(3-0)**

Canadian Literature from its Origins to 1950
A survey of Canadian literature from its beginnings to the middle of the twentieth century.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 471 and 470 will not be allowed.

English 473 **3 units; H(3-0)**

Canadian Literature since 1950
A survey of Canadian literature from 1950 to the present.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 473 and 470 will not be allowed.

English 481 **3 units; H(3-0)**

Literary Theory from its Origins to 1800
A survey of the major theories of and approaches to literature from classical times to 1800.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 481 and 480 will not be allowed.

English 483 **3 units; H(3-0)**

Literary Theory since 1800
A survey of the major theories of and approaches to literature from 1800 to the present.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 483 and 480 will not be allowed.

English 490 **3 units; H(3-0)**

Postcolonial and Diasporic Literatures
A survey of literatures and theories from the Pacific, Atlantic, and Indian Ocean regions.

Prerequisite(s): English 302 and one of 240 or 340.

Antirequisite(s): Credit for English 490 and 492 will not be allowed.

English 491 **3 units; H(3-0)**

Postcolonial and Diasporic Literatures: Selected Region
A survey of literatures and theories from any one of the following regions: Pacific, Atlantic, or Indian Ocean.

Prerequisite(s): English 302 and one of 240 or 340.

English 493 **3 units; H(3-0)**

International Indigenous Literatures
A survey of writing by indigenous peoples from selected regions around the world.

Prerequisite(s): English 302 and one of 240 or 340.

English 494 **6 units; F(3-0)**

Poetry Writing II
A close examination and discussion of the student's own work, with emphasis on technique.

Prerequisite(s): 6 units of English at the 200 level and consent of the Department.

Note: One month before the start of classes, prospective students must submit a portfolio of their own work for evaluation before consent of the Department will be given. Details of this procedure are available from the Department of English.

English 496 **6 units; F(3-0)**

Fiction Writing II
A close examination and discussion of the student's own work, with emphasis on technique.

Prerequisite(s): 6 units of English at the 200 level and consent of the Department.

Note: One month before the start of classes, prospective students must submit a portfolio of their own work for evaluation before consent of the Department will be given. Details of this procedure are available from the Department of English.

English 501 **3 units; H(3-0)**

Studies in Drama
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 503 **3 units; H(3-0)**

Studies in Fiction or Non-Fictional Prose
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 504 **6 units; F(3-0)**

Honours Project
Prerequisite(s): 6 units of English at the 400 level and consent of the Department.

Note: Restricted to English Honours students. Students are advised to consult with the English Department for information and advice by January 31 of the year in which they plan to register in English 504. See the departmental website for more information.

English 505 **3 units; H(3-0)**

Studies in Poetry
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 507 **3 units; H(3-0)**

Studies in British Literature
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 509 **3 units; H(3-0)**

Studies in Canadian Literature
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 511 **3 units; H(3-0)**

Studies in American Literature
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 515 **3 units; H(3-0)**

Postcolonial Studies
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 517 **3 units; H(3-0)**

Theoretical and Cultural Studies
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 519 **3 units; H(3-0)**

Studies in a Literary Period
Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 520 **3 units; H(3-0)**

Community Engagement Through Literature
Combines classroom and community-based learning undertaken in association with the Calgary Public Library or other associated non-profit organizations that promote engagement with literature.

Prerequisite(s): 6 units of English at the 400 level and consent of the Department.

English 523 **3 units; H(3-0)**

(formerly English 521)

Studies in Book and Digital Culture
Advanced topics in book history, digital humanities, and new media.

Prerequisite(s): 6 units of English at the 400 level.

MAY BE REPEATED FOR CREDIT

English 593 **3 units; H(3-0)**

Studies in Creative Writing: Poetry
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): English 364 and 494 and consent of the Department.

Note: One month before the class begins, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 594 **3 units; H(3-0)**

Studies in Creative Writing: Prose Fiction
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): English 366 and 496 or equivalent and consent of the Department.

Note: One month before the class begins, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 595 **3 units; H(3-0)**

Studies in Creative Writing: Creative Non-Fiction
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): 12 units from English 364, 366, 494, 496 and consent of the Department.

Note: One month before the class begins, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 598 **6 units; F(3-0)**

The Book-Length Manuscript
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): Consent of the Department.

Note: One month before the start of classes, prospective students must submit a portfolio of their own work for evaluation before consent of the Department will be given. Details of this procedure are available from the Department of English. Recommended preparation for English 598 is dependent on genre. Students should consult with the Department for more information.

MAY BE REPEATED FOR CREDIT

Graduate Courses

English 603 **3 units; H(3S-0)**

Studies in Genre
MAY BE REPEATED FOR CREDIT

English 605 **3 units; H(3S-0)**

Studies in National or International Literatures
MAY BE REPEATED FOR CREDIT

English 607 **3 units; H(3S-0)**

Theoretical and Cultural Studies
MAY BE REPEATED FOR CREDIT

English 609 **3 units; H(3S-0)**

Studies in a Literary Period
MAY BE REPEATED FOR CREDIT

English 613 **3 units; H(3S-0)**
(formerly English 612)

Studies in Medieval and Renaissance Literature
MAY BE REPEATED FOR CREDIT

English 619 **3 units; H(3S-0)**
(formerly English 618)

Studies in Restoration and Eighteenth-Century Literature
MAY BE REPEATED FOR CREDIT

English 677 **3 units; H(3S-0)**
(formerly English 676)

Studies in Canadian Literature
MAY BE REPEATED FOR CREDIT

English 681 **3 units; H(3S-0)**
(formerly English 680)

Studies in Literary Criticism
MAY BE REPEATED FOR CREDIT

English 685 **3 units; H(3S-0)**
(formerly English 684)

Special Topics
MAY BE REPEATED FOR CREDIT

English 691 **3 units; H(3S-0)**

Graduate Pro-seminar
Introduces incoming graduate students to critical skills and professional issues in graduate level literary studies.

Note: Required of all graduate students who have not had an equivalent course.

NOT INCLUDED IN GPA

English 693 **3 units; H(3S-0)**

Studies in Creative Writing: Poetry
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): Consent of the Department.

Note: One month before the class begins, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 694 **3 units; H(3S-0)**

Studies in Creative Writing: Prose Fiction
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): Consent of the Department.

Note: One month before the class begins, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 695 **3 units; H(3S-0)**

Studies in Creative Writing: Creative Non-Fiction
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): Consent of the Department.

Note: One month before the class begins, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 698 **6 units; F(3S-0)**

Studies in Creative Writing
A close examination and discussion of the student's own work, with emphasis on advanced technique.

Prerequisite(s): Consent of the Department.

Note: By mid-August, prospective students must submit a portfolio of their own work for evaluation before consent to register for this course will be given. Details of this procedure are available from the Department of English.

MAY BE REPEATED FOR CREDIT

English 710 **3 units; H(1-0)**

Capstone Project
Prerequisite(s): Consent of the Department.

Note: Restricted to and required of all Master of Arts (one year project-based) students. By June 1, students must submit a topic proposal to the Graduate Program Director for approval. Details of this procedure are available from the Department of English.

NOT INCLUDED IN GPA

Entrepreneurship and Innovation ENTI

Instruction offered by members of the Haskayne School of Business.

Junior Course

Entrepreneurship and Innovation 201 **3 units; H(3-0)**

Introduction to Business Venturing
Introduction to the various business disciplines from the perspective of creating a new business venture. The primary learning methodology is a term project; students identify a business opportunity, research the opportunity, and write a business plan for the business.

Antirequisite(s): Credit for Entrepreneurship and Innovation 201 and either Management Studies 217 or Strategy and Global Management 217 will not be allowed.

Note: Not available for credit towards the Bachelor of Commerce. Required for the Minor in Management and Society and the Minor in Entrepreneurship and Enterprise Development.

Senior Courses

Entrepreneurship and Innovation 317 **3 units; H(3-0)**

Entrepreneurial Thinking
Leaders in today's business environment are challenged to think entrepreneurially-to seek opportunities and find ways to turn opportunities into viable for-profit business ventures, social ventures or not-for-profit organizations. They are challenged to

do more than just business; giving back to society is expected. The primary learning methodology is through a project in which students identify an opportunity, research the opportunity, and write and present the results of their feasibility assessment.

Prerequisite(s): Admission to the Haskayne School of Business Bachelor of Commerce program, Management Studies 217 and Strategy and Global Management 217.

Entrepreneurship and Innovation 381
3 units; H(3-0)

Principles of Entrepreneurship
Overview of the process of entrepreneurship with focus on the role of the entrepreneur in new venture initiative and development. Introduction to the processes involved in: idea generation, evaluation, business planning or operations.

Prerequisite(s): Entrepreneurship and Innovation 201, or Business and Environment 291, or Management Studies 217 and Strategy and Global Management 217.

Entrepreneurship and Innovation 401
3 units; H(3-0)

Opportunity Identification
Application of knowledge of the processes involved in idea generation and evaluation ending in the technical, market, financial and human resource feasibility of a concept. Critical literature will be reviewed as it applies to the early stages of concept development and evaluation.

Prerequisite(s): or Corequisite: Entrepreneurship and Innovation 381.

Entrepreneurship and Innovation 403
3 units; H(3-0)

New Venture Planning
A project-based course in developing and writing a business plan for an existing and/or growth oriented venture. Focus will be given to the content, form and uses of a formal business plan.

Prerequisite(s): or Corequisite: Entrepreneurship and Innovation 381.

Entrepreneurship and Innovation 405
3 units; H(3-0)

New Venture Start-Up
Application of the strategies and tactics for the creation and growth of a potential new venture. Students will address key questions in bringing together critical resources to launch a venture, review important empirical research in the field and participate in project work.

Prerequisite(s): or Corequisite: Entrepreneurship and Innovation 381.

Entrepreneurship and Innovation 559
3 units; H(3-0)

Selected Topics in Entrepreneurship and Innovation
Investigation of selected topics related to entrepreneurship, venture development and family business, emphasizing the practical application of theory and principles to actual business situations and venture opportunities.

Prerequisite(s): Admission to the Haskayne School of Business. For certain topics consent of the Haskayne School of Business will also be required.

Corequisite(s): Entrepreneurship and Innovation 381.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Entrepreneurship and Innovation 781
3 units; H(3-0)

Introduction to Entrepreneurship
An experience-based course covering the prestart-up stage of business development through group projects and case studies designed to provide experience-based skill development in creativity, idea generation, and feasibility analysis.

Entrepreneurship and Innovation 783
3 units; H(3-1)

Opportunity Development
A project- and case-based course designed to explore concepts of opportunity development.

Entrepreneurship and Innovation 785
3 units; H(3-0)

Venture Development
A project-based course designed around the formation of business concepts in the formalization of a business plan.

Entrepreneurship and Innovation 787
3 units; H(3-0)

Applied Business Analysis
Approaches to advising new and existing ventures on effective venture development. Projects will involve the student conducting analysis of several ventures and providing advice to them.

Prerequisite(s): Marketing 601 or consent of the Haskayne School of Business.

Entrepreneurship and Innovation 791
3 units; H(3-0)

Technology Commercialization
The process of taking a technology product or service from development to the market, including market strategies, finding investors and potential early customers, the role of advisors, legal issues and the importance of the exit strategy for founders and early stage investors. Students will be required to complete a major project to write a feasibility study for a new technology or a case study of a successful technology venture.

Entrepreneurship and Innovation 793
3 units; H(3-0)
(formerly Entrepreneurship and Innovation 797.03)

Technology and Innovation Management
The dynamics of innovation as the primary driving force within firms and modern industrialized economies. Potential concepts are: incremental versus radical innovations, market-pull versus technology-push theories, dominant designs, technological trajectories, key factors for successful innovation. The emergence of new technologies; the importance of national and regional innovation systems; the role of science, regulations and social pressure in innovations dynamics; knowledge management; and implications for firms in rapidly changing industrial settings may be discussed.

Entrepreneurship and Innovation 797
3 units; H(3S-0)

Advanced Seminar in Venture Development
797.02. Strategic Legal Planning for New Ventures

Prerequisite(s): Consent of the Haskayne School of Business.

Entrepreneurship and Innovation 799
3 units; H(3S-0)

Doctoral Seminars in Venture Development
799.01. Entrepreneurship: The State of the Art

799.02. Conceptual Models and Theories of New Venture Development

799.03. Special Topics in Entrepreneurship and Innovation

799.04. Advanced Topics in Entrepreneurship

Environmental Design EVDS

The following list of courses, offered by members of the Faculty of Environmental Design and members of other departments in the University, is specific to this academic year. Students are advised that some of the courses listed below may not be offered every year depending upon circumstances. Students should consult with the EVDS Graduate Program Administrator before registering in the following courses.

Environmental Design 401 **3 units; H(3-0)**

Introduction to Environmental Design
An examination of the central concepts of environmental design, delivered in an online format. Topics include: the natural, built and human environments, and interdisciplinary issues.

Environmental Design 523 **3 units; H(3-0)**

Sustainability in the Built Environment
The principle of sustainability recognizes people as temporary stewards of their environments, working toward a respect for natural systems and a higher quality of life. Examination of the built environment and the tools to achieve a stable and balanced and a regenerative ecosystem in a process of responsible consumption, wherein waste is minimized and the built environment interacts with natural environments and cycles. Healthful interior environments, resource efficiency, ecologically benign materials, renewable energies and social justice issues are examined.

Antirequisite(s): Credit for Environmental Design 523 and Architectural Studies 423 will not be allowed.

Environmental Design 583 **3 units; H(3-0)**

Special Topics in Environmental Design
Thematic inquiry and design related to environmental design topics.

MAY BE REPEATED FOR CREDIT

Environmental Design 597 **1.5 units; Q(3-0)**

Special Topics in Environmental Design
Thematic inquiry and design related to environmental design topics.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Environmental Design 601 **3 units; H(3-0)**
(Architectural Study 483)

Conceptual Bases of Environmental Design
Conceptual frameworks in Environmental Design and theories related to design and environment that influence environmental design thinking and practice.

Antirequisite(s): Credit for Environmental Design 601 and Architectural Studies 483 will not be allowed.

Note: Students are strongly encouraged to complete Environmental Design 601 prior to entering their second registration year.

Environmental Design 603 3 units; H(0-8)

Introduction to Design Thinking
Foundation concepts in design and form making involving a sequence of progress skill building, visual and spatial thinking and problem solving exercises.

Antirequisite(s): Credit for Environmental Design 603 and Environmental Design Architecture 580 will not be allowed.

Environmental Design 616 3 units; H(3-0)

Urban Infrastructure and Land Use
Acquaints students with the key infrastructure systems of a city. Examines current policies, standards and practices, challenges, and innovations in the following infrastructure sectors: water, sewage, waste management, open space, energy, transportation, and communication. Discusses the relationship between infrastructure systems and land use, and its impacts on quality of life, economic development, spatial structure, and the environment. Emphasis is given to green infrastructure development. The course also examines various financial and institutional frameworks for delivering infrastructure systems, and how they vary across different contexts.

Environmental Design 618 3 units; H(0-8)

Urban Design Studio
This studio aims to further develop skills in conceptualization and visualization through consideration of contemporary urban design issues. It includes documentation and analysis of urban form and process, and explores site planning and design of the public realm. Issues of local and regional identity and sustainability inform the approach of the studio.

Prerequisite(s): Environmental Design Planning 637 or permission of the instructor.

Environmental Design 621 3 units; H(3-0)

Health in the Built Environment
Concepts of health in an environmental context; historic approaches to preventative medicine; medical basis of building-related illness; case studies in indoor air quality; strategies for prescription and design of healthy indoor environments.

Environmental Design 622 3 units; H(3-0)

Real Estate Development and Finance
Focuses on the principles of real estate development and finance. Provides hands-on experience through real-world simulations and case studies. Goal is for students to gain a basic understanding of the planning process in real estate development, including private public partnerships, and development impacts. Introduces fundamental tools for conducting an economic and fiscal analysis of real estate proposals. Students will have an opportunity to develop a pro forma as part of a risk assessment. Other topics include the use of GIS for location studies and market assessment.

Environmental Design 623 3 units; H(0-8)

Regional Planning Studio
An overview of the history and theory of regional planning and an overview of regional planning institutional frameworks and issues in a Canadian regional planning context. Understanding current regional planning issues and institutional, legislative and policy frameworks in a Canadian land use planning context related to growth management, resource extraction, infrastructure and services, transportation, strategic planning, water and airshed management. A review and examination of regional land use planning and policy tools and role of regional planners in inter-jurisdictional and transboundary government and public-private stakeholder engagement mechanisms. Preparation of a plan.

Prerequisite(s): Environmental Design Planning 637 or permission of the instructor.

Environmental Design 624 3 units; H(3-0)

Impact Assessment and Risk Management
EIA is the process of identifying, predicting, evaluating and mitigating the environmental effects of development proposals prior to major decision-making. Biophysical, economic and social impact assessment will be reviewed in an integrated, interdisciplinary approach which will include lectures, studies of methodologies, theory and practical problems, and discourse with practitioners. Federal and various Provincial environmental impact assessment policies and procedures will be critically analyzed.

Environmental Design 628 3 units; H(3-0)

Housing and Neighbourhood Change
Considers urban growth management, affordable housing, suburban growth and inner-city redevelopment, current suburban development patterns, as well current municipal goals regarding density and intensification and precedents/best practices. Theoretical understanding and practical insights into these issues through assessment of the social, economic, and spatial aspects related to housing and neighbourhood change.

Environmental Design 643 3 units; H(3-0)

Field Studies
Introduction to the architecture, urban landscape, planning issues, design culture and other relevant faculty topics in an international setting. Specific destination and itinerary in any given year are dependent on availability and interest. Through a week long field trip students will learn about the built and natural environment of the selected city and its context.

Prerequisite(s): Open only to students in Environmental Design degree programs.

Environmental Design 671 3 units; H(3-0)

Urban Design Theory
Intended to provide students with an introduction to theories, concepts, methods and contemporary issues in urban design. The course consists of lectures, case studies, seminars and short projects.

Environmental Design 675 3 units; H(3-0)

Urban Systems
Provides a general overview of urban history, development and planning traditions. Lectures and field studies give a chronological overview of urban, architectural and design history and the inter-relation to political programs, economic and strategic planning as well as cultural nationalism. The course will extract a number of more general issues about contemporary cities for debate.

Prerequisite(s): Open only to students in Environmental Design degree programs.

MAY BE REPEATED FOR CREDIT

Environmental Design 683 3 units; H(3-0)

Advanced Special Topics in Environmental Design
Thematic inquiry and design related to environmental design topics.

MAY BE REPEATED FOR CREDIT

Environmental Design 697 1.5 units; Q(3-0)

Advanced Special Topics in Environmental Design
Thematic inquiry and design related to environmental design topics.

MAY BE REPEATED FOR CREDIT

Environmental Design 703 1.5 units; Q(0-3)

Directed Study in Environmental Design
Thematic research, readings or design studio project related to environmental design topics.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Environmental Design 711 3 units; H(0-8)

Theoretical Basis for Interdisciplinary Intervention and Design
Comparisons and contrasts among disciplinary, multidisciplinary and interdisciplinary intervention and research. Focus on interdisciplinary teamwork knowledge and skills, on the ability to integrate research into professional real world contexts and on the ability to communicate research results effectively. This course is open only to students registered in a PhD program.

Environmental Design 723 3 units; H(0-6)

Interdisciplinary Intervention in Environmental Design
Interdisciplinary teams will tackle client-based real world environmental design problems. Intervention strategies and design as a problem-solving approach to complex urban, ecological, social, and technological interactions will be addressed.

723.02. Sustainable Futures and Planning Scenarios

723.03. People and Technology

Environmental Design 753 3 units; H(3-3)

Research Skills and Critical Thinking
Exploration of the research process in an environmental design context and using design as a method of research. Design of innovative research methods appropriate for environmental design research. Development of skills in research design and critical thinking while writing a research proposal.

MAY BE REPEATED FOR CREDIT

Environmental Design 783 3 units; H(0-3)

Directed Study in Environmental Design
Thematic research, readings or design studio project related to urban design, architecture, environmental design topics.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Environmental Design 793 3 units; H(0-8)

Workshop in Environmental Design
Instruction and supervised experience in the use of tools and equipment for the development of study models, prototypes and graphic material related to student projects.

Prerequisite(s): Consent of the Faculty.

Environmental Design 797 3 units; H(3-0)

Preceptorship
A Preceptorship is a study and training arrangement made between a student and an employer or an equivalent supervisor which has specific educational objectives, a method of evaluation, and is an integral part of a student's Program of Studies. Preceptorships offer a number of benefits: acquiring skills and knowledge which may be

better obtained outside the University; developing first-hand experience of professional design practice; preparing for more focused studies in the Faculty; and conducting research.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Environmental Design Architecture EVDA

Instruction offered by members of the Faculty of Environmental Design.

Environmental Design Architecture courses are only open to students in the Master of Architecture program or with consent of the Instructor. Priority will be given to students in the MArch program.

Environmental Design Architecture 511
3 units; H(3-0)

Building Science and Technology I
Functioning of the building enclosure: demonstration of the behaviour of building elements and their sub-assemblies under differential temperature and pressure stresses; fundamentals of acoustics; nature and use of building materials; response of building materials to climatic cycles radiation, precipitation, heating and cooling.

Antirequisite(s): Credit for Environmental Design Architecture 511 and Architectural Studies 449 will not be allowed.

Environmental Design Architecture 523
3 units; H(3-0)

History of Architecture and Human Settlements
A survey history of architecture and human settlement from the prehistoric times until the present. The first course addresses the premodern traditions of the major world cultures. The second course explores the traditions of the Western world from the beginning of the Italian Renaissance until the present. The courses will examine the changes in world view that have altered the course of architecture through the study of selected works of architecture and urbanism.

523.01. History of Architecture and Human Settlements I - Premodern Traditions of the World.

523.02. History of Architecture and Human Settlements II - The Rise of Modernity, 1750 to Present.

Antirequisite(s): Credit for Environmental Design Architecture 523 and Architectural Studies 457 will not be allowed.

Environmental Design Architecture 541
3 units; H(0-8)

Graphics Workshop I
A skill building course with instruction and supervised experience in basic drafting, sketching and rendering; principles of perspective, drawing and presentation conventions. A variety of instruction may be offered to accommodate the varied level of student development.

Corequisite(s): Environmental Design Architecture 580.

Antirequisite(s): Credit for Environmental Design Architecture 541 and Architectural Studies 451 will not be allowed.

Environmental Design Architecture 543
3 units; H(0-8)

Graphics Workshop II
Instruction and supervised experience in drafting, sketching and rendering; drawing and presentation conventions. Builds on Environmental Design Architecture 541. A variety of instruction may be offered to accommodate the varied level of student development.

Corequisite(s): Environmental Design Architecture 582.

Antirequisite(s): Credit for Environmental Design Architecture 580 and Architectural Studies 453 will not be allowed.

Environmental Design Architecture 580
6 units; F(0-8)
(formerly Environmental Design 503)

Studio I – Design Thinking
Instruction and supervised experience in drafting, sketching and rendering; drawing and presentation conventions. A variety of instruction may be offered to accommodate the varied level of student development.

Corequisite(s): Environmental Design Architecture 541

Antirequisite(s): Credit for Environmental Design Architecture 580 and Architectural Studies 484 will not be allowed.

Environmental Design Architecture 582
6 units; F(0-8)

Studio II in Architecture
An introduction to the application of ordering principles of architecture and to the numerous layers that contribute to the quality of inhabitation of place and space through design. Issues explored include the formal, the experiential and the theoretical concerns of architectural design in today's cultural context.

Corequisite(s): Environmental Design Architecture 543

Antirequisite(s): Credit for Environmental Design Architecture 582 and Architectural Studies 444 will not be allowed.

Graduate Courses

Environmental Design Architecture 611
3 units; H(3-0)

Building Science and Technology II
Theory and principles of structural, foundation and building service systems. Application of building science principles to building structure and enclosure, examination of the types and manufacture of building elements and the application of building components to specific problems in architecture.

Environmental Design Architecture 613
3 units; H(3-0)

Structures for Architects I
Fundamentals of Structural Analysis including: the characteristics and performance of the various components of structures; the terminology and notation necessary for effective teamwork with structural engineering consultants; and basic design calculations for simple structures.

Environmental Design Architecture 615
3 units; H(3-0)

Environmental Control Systems
Approaches to the design of heating, cooling, and ventilation systems for buildings. Issues in system design such as energy efficiency and indoor air quality.

Environmental Design Architecture 617
1.5 units; Q(3-0)

Architectural Lighting Design
Fundamentals of light and visual perception. Approaches to the design of non-uniform and uniform lighting systems for buildings. Issues in system design such as human satisfaction and performance and energy efficiency. Development of skills in the selection and design of lighting systems.

Environmental Design Architecture 619
3 units; H(3-0)

Structures for Architects II
Advanced structural systems for buildings including: structural connections and composite structures; system characteristics and architectural intent; and case studies in contemporary building structures.

Environmental Design Architecture 621
3 units; H(3-0)

Introduction to Design Theories
The contemporary cultural, social, and philosophical arenas in which architecture exists are examined through lectures, readings and seminars.

Environmental Design Architecture 661
3 units; H(3-0)

Architectural Professional Practice
The nature of the building industry, stakeholders and many of the participants and their responsibilities. Brings together the theoretical framework of the architect's role in society with the practicality of managing a practice. Project management and office administration, trends, liabilities and systems for project control such as building economics; cost analysis and estimating techniques; and cost controls during design and construction.

Environmental Design Architecture 682
6 units; F(0-8)

Intermediate Architectural Design Studio
An intermediate design studio in which students work on projects defined by the instructor. Topics may vary from year to year. They are determined by the creative interests of the faculty assigned to the course. Enrolment may be limited.

682.02 Intermediate Studio

682.04 Comprehensive Design Studio

Note: Environmental Design Architecture 682.02 and 682.04 must be successfully completed in numerical order.

Environmental Design Architecture 703
3 units; H(0-3)

Directed Study in Architecture
Research and readings in architecture and design related to the Senior Research Studio in Architecture.

MAY BE REPEATED FOR CREDIT

Environmental Design Architecture 782
6 units; F(0-8)

Senior Research Studio in Architecture
A research design studio in which students collaborate with design faculty in exploring projects that engage contemporary issues defining the built and natural environments.

MAY BE REPEATED FOR CREDIT

Environmental Design Landscape EVDL

Instruction offered by members of the Faculty of Environmental Design.

Environmental Design Landscape courses are only open to students in the Master of Landscape Architecture program or with consent of the Instructor.

Graduate Courses

Environmental Design Landscape 603
3 units; H(2-2)

Site Technology I: Grading and Landform
Provides a working knowledge of grading, landform and storm water management systems and techniques. Covers fundamentals and advanced technologies including GPS grading and landform manipulation.

Environmental Design Landscape 605
3 units; H(2-2)

Site Technology II: Construction and Materials
Provides a working knowledge of landscape construction methods and materials through practical application of theories and techniques via a design project.

Environmental Design Landscape 607
3 units; H(2-2)

GIS for Landscape Architecture
Application of GIS modelling techniques to landscape planning, design and management issues. Advanced consideration of GIS for spatial planning and application to studio and research projects.

Environmental Design Landscape 609
3 units; H(0-3)

Advanced Digital Design, Representation and Communication for Landscape Architecture
Digital media offers a variety of tools and techniques to experiment, communicate and visualize their ideas and to collaborate with colleagues, allied professionals, and the public. Provides instruction in current methods and techniques of digital media used in the research and practice of landscape architecture, as well as state-of-the-art communication, collaboration and visualization hardware and software.

Environmental Design Landscape 629
3 units; H(3-0)

Landscape Architecture History and Theory
An introduction to the history, theory and contemporary issues of landscape architecture. Develop a critical awareness of major conceptual frameworks, and the socio-political contexts in which they developed, both conceptually and in realized projects.

Environmental Design Landscape 639
3 units; H(2-2)

Landscape Responses to Climate Change, Energy and Water
Identifies landscape-oriented solutions to local and global issues of climate change, energy, and water problems through research and project proposals. Provides the opportunity to identify the most pressing local, regional or international issues and develop solutions.

Environmental Design Landscape 641
3 units; H(2-2)

Green Infrastructure/Winter City Design
An introduction to the systems of urban and regional resource management through targeted green infrastructure projects, particularly in a winter city context. Provides background on current methods, the state-of-the-art, and research and development that will shape future technologies. Identifies contemporary approaches, sociocultural, and ecological concepts for using plant material in landscapes, green roofs and biomass.

Environmental Design Landscape 643
3 units; H(3-0)

Professional Practice and Project Management for Landscape Architecture
An introduction to the professional practice of landscape architecture. Includes the legal and ethical frameworks for practice, as well as project management.

Environmental Design Landscape 677
3 units; H(0-8)

Landscape Architecture Studio
An integration of skills and processes developed to this point in the program through an investigation into a topical, issue-based problem, and development of solution(s) in a landscape context.

Environmental Design Landscape 777
6 units; F(0-8)

Senior Research Studio in Landscape Architecture
A research-oriented project studio that explores contemporary themes in landscape architecture. Centres on a real world problem or project; the analysis of issues and context, and the formulation of a comprehensive design solution involving advanced methods, techniques and practices.

Environmental Design Planning EVDP

Instruction offered by members of the Faculty of Environmental Design.

Environmental Design Planning courses are only open to students in the Master of Planning program or with consent of the Instructor.

Graduate Courses

Environmental Design Planning 602
3 units; H(2-2)
(formerly Environmental Design 602)

Computer Modelling for Urban Design
Introduction to the use of computer modelling, animation and virtual reality in urban design. Professional CAD and rendering applications will be used to explore the aesthetic and technical aspects of design. Emphasis given to developing sensitivity to the application appropriate to communicating three dimensional urban and natural form using computer generated images.

Environmental Design Planning 611
3 units; H(2-2)
(formerly Environmental Design 611)

Geographic Information Systems for Environmental Design
Introduction to the use of GIS in urban planning and environmental management. GIS modelling focusing on population projection, location theory, land use modelling and environmental and ecological management. Case studies from both the public and private sector provide the basis of assignments. Emphasis given to developing sensitivity to the application appropriate for specific GIS problems.

Environmental Design Planning 621
3 units; H(3-0)

Professional Planning Practice
Considers various plans, policies, regulatory processes, legal institutions and administrative frameworks involved in urban and regional planning. Examines the role of planners in municipal development processes related to land use re-designations, development permits, subdivision and appeals. Discusses professional planning issues including ethics, relationships with clients, the public, and other professions. Discusses practice options for graduates including professional certification/registration.

Environmental Design Planning 625
3 units; H(0-8)

Site Planning Studio
Introduction to urban design practice. Emphasizes sense of place, human behavior/built form relationships and sustainability. Completion of a series of progressively complex site planning projects. Skills development in hand and computer-aided drawing to describe, document and analyze urban form and processes and to develop physical plans.

Environmental Design Planning 626
3 units; H(4-4)
(formerly Environmental Design 626)

Landscape Ecology and Planning
Key concepts in ecology, landscape ecology and environmental science relevant to planning at landscape scales. Principles of urban ecology, regional landscape ecology, watershed management and parks and protected area design are coupled with knowledge of landscape processes, ecosystem services, ecological infrastructure, and habitat to assess planning interventions in the built and natural environments. Skills are developed in geographic information systems (GIS) for monitoring the current state of landscapes and potential challenges to landscape function and for proposing solutions to these challenges. Includes guest speakers from government and industry, GIS exercises and field visits to various areas within the region.

Environmental Design Planning 627
3 units; H(3-0)

Planning History and Theory
An introduction to theories and practices of planning with a focus on the late nineteenth century to the present. Explores the forces that shaped cities/regions and key ideas/models invented in response. Examines the relationship between theory/practice and past/present. Explores the influence of planners, architects, landscape architects, and others on planning theory and resulting physical form. Presents case studies and examples in the Canadian context. Develops a critical awareness of the roles of environmental design professionals within a framework that of technical, social, environmental and political factors.

Environmental Design Planning 631
3 units; H(3-0)

Planning and Public Engagement
Overview of key principles and theories, and contemporary issues and tools of participation and public engagement as it applies to planning. Consideration of public engagement, facilitation, negotiation and conflict resolution processes from the point of view of community activists, city planners, developers and planning/design professionals. Development and implementation of public engagement plans.

Environmental Design Planning 633
3 units; H(3-1)

Project Management for Planners
Principles, techniques and tools of project management. Development, administration, monitoring and evaluation of implementation plans, including financial aspects are discussed. Project risk analysis and management.

Environmental Design Planning 635
3 units; H(3-0)

Analytic Methods for Planners
Approaches to identify, gather and critically analyze strategic information needed to assess planning situations and support decision-making. Focuses on both quantitative and qualitative planning methods. Techniques to present information effectively.

Environmental Design Planning 637
3 units; H(0-8)

Community Planning Studio
Introduction to land use planning and development issues. Provides a step-by-step introduction to community planning processes and essential planning policies to create development that is economically feasible, socially inclusive and environmentally sustainable.

Prerequisite(s): Environmental Design Planning 625 or equivalent.

Environmental Design Planning 644
6 units; F(0-6)

Advanced Professional Planning Studio
An advanced studio exploring contemporary themes in planning and professional planning practice. Centres on a real world problem or client project; involves analysis, synthesis, and formulation of a planning or urban design solution. Culminates in a professional report and presentation.

Prerequisite(s): Environmental Design Planning 625, 637 and one of Environmental Design 618 or 623.

Environmental Engineering ENEN

Instruction and services offered by Centre for Environmental Engineering Research & Education (CEERE), Schulich School of Engineering.

Graduate Courses

Environmental Engineering 603 3 units; H(3-0)

Principles of Environmental Engineering
Mass and energy balance for reacting and non-reacting environmental engineering systems under steady state and unsteady state conditions. Fundamentals of momentum, heat and mass transfer as applied in air and water pollution. Thermodynamic and phase equilibria considerations. Contaminant partitioning and transport in air, surface water and groundwater. Chemical reaction kinetics. Application of ideal continuously stirred tank reactor (CSTR) and plug flow reactor (PFR) concepts in environmental engineering. Residence time distribution (RTD) and reactor non-idealities. Introduction to life cycle analysis.

Environmental Engineering 605 3 units; H(3-0)

Environmental Chemistry and Microbiology
Chemistry of organic and inorganic contaminants in the environment. Natural chemical cycles in the biosphere, geosphere, hydrosphere and atmosphere, and consequences of anthropogenic disturbances. Aquatic, atmospheric and soil chemistry. The fate of hazardous, refractory and heavy metal pollutants in the environment. Introductory toxicological chemistry and atmospheric chemistry. Analytical techniques for contaminants in air, water, energy and soil. Introductory microbiology: characteristics and classification of microorganisms, kinetics and mathematical models of microbial growth, applications in environmental engineering. Introduction to ecology.

Environmental Engineering 619 3 units; H(3-0)

Special Topics
New courses on specialized topics relevant to environmental engineering. It may also be offered to doctoral degree students to enable them to pursue advanced studies in particular areas under the direction of a faculty member, which must be arranged and approved prior to registration.

MAY BE REPEATED FOR CREDIT

Environmental Engineering 621 3 units; H(3-0)
(Chemical Engineering 701)

Experimental Design and Error Analysis
Statistical analysis and design of engineering experiments. Random variables and sampling distributions; estimation and hypothesis testing; concepts of central tendency, variability, confidence level; correlation, regression and variation analysis; robust estimation; experiments of evaluation; experiments of comparison; factorial experiments (analysis of variance); experimental designs (involving randomization, replication, blocking and analysis of covariance).

Antirequisite(s): Credit for Environmental Engineering 621 and Chemical Engineering 701 will not be allowed.

Environmental Engineering 623 3 units; H(3-0)

Air Dispersion Modelling
Regulations and policy. Mathematical models of contaminant transport in the atmosphere. Atmospheric thermodynamics. Turbulence in the planetary boundary layer. Turbulence and air pollution meteorology. Gaussian plume. Gradient transport and higher-order closure models. Point, area and line sources. Similarity theories. Basic statistical methods applied to turbulent flows. Urban air shed modelling. Theoretical development and practical applications to engineering problems. Air dispersion modelling using computer software.

Environmental Engineering 625 3 units; H(3-0)

Computational Methods for Environmental Engineering
Taylor series, numerical integration. Linear and non-linear algebraic equations and solvers. Ordinary and partial differential equations. Finite difference methods: explicit, implicit and Crank-Nicholson methods. Finite difference, finite element or finite volume numerical approximations. Initial and boundary value problems. Boundary conditions, discretization considerations, and design of approximations, accuracy and error reductions. Applications in environmental engineering, such as pollutant dispersion and transport, will be discussed.

Antirequisite(s): Credit for Environmental Engineering 625 and any of Chemical Engineering 639, Civil Engineering 743 or Mechanical Engineering 631 will not be allowed.

Environmental Engineering 627 3 units; H(3-0)

Contaminant Transport
Mathematical models for contaminant transport in ground water. Flow/transport through porous media, advection, dispersion, diffusion. Sources and sinks. Applications of analytical finite element and finite difference equations, Environmental modelling using computer software.

Environmental Engineering 631 3 units; H(3-0)

Spatial Statistics for Environmental Modelling
Spatial statistics for topological, geometric and geographic properties. Spatial statistical models for data having an explicit spatial distribution. Basic and advanced methods in geo-spatial statistics for point, area and continuous variables. All levels (from visual to analytical) of possible spatial analysis techniques are examined for each type of variable and applications in environmental modelling are used to illustrate the concepts.

Environmental Engineering 633 3 units; H(3-0)

Fuzzy Logic for Environmental Engineering
Complex, non-linear, or ambiguous system models. Fuzzy set theory, fuzzy logic operations, fuzzification and de-fuzzification. Development of membership functions, fuzzy system simulation, Rule-based reduction methods, Fuzzy classification and pattern recognition, Fuzzy arithmetic and extension principle, Fuzzy Control and Fuzzy cognitive mapping, applications in environmental engineering.

Environmental Engineering 635 3 units; H(2-2)
(Geomatics Engineering 583)

Environmental Modelling
Nature and purpose of environmental modelling; the top-down and the bottom-up approaches; typology of environmental models; definition of fundamental concepts; steps involved in designing and building a model; calibration, verification and validation of models; scale dependency; sensitivity analysis; characteristics, architecture and functioning of selected environmental models.

Environmental Engineering 637 3 units; H(3-0)
(Geomatics Engineering 637)

Earth Observation for the Environment
An introduction to environmental earth observation systems in particular to satellite platforms. Topics include: discussion of physical principles; imaging system geometries; radiometric corrections, including calibration and atmospheric correction; spatial filtering for noise removal and information extraction; geometric corrections, including rectification and registration; fusion of multi-dimensional datasets; and application of satellite images in addressing selected environmental issues.

Antirequisite(s): Credit for Environmental Engineering 637 and Geomatics Engineering 637 or 655 will not be allowed.

Environmental Engineering 641 3 units; H(3-0)
(Chemical Engineering 643)

Air Pollution Control Engineering
Introduction to air quality and air pollution. Energy and air pollution. Fossil fuel combustion and related air pollution. Industrial air pollution control. Control of particulate matter. Control of VOCs, SOx, and NOx. Adsorption, absorption and biofiltration of air pollutants. GHG emission control. Recent advances on related topics.

Antirequisite(s): Credit for Environmental Engineering 641 and Chemical Engineering 643 will not be allowed.

Environmental Engineering 643 3 units; H(3-0)

Air Pollutant Sampling and Characterization
Fundamentals and principles of air pollutant sampling and characterization. Kinematics of gases. Principles of gaseous pollutant sampling. Aerosol technology. Isokinetic sampling. Statistics and data analyses for airborne particulate matter.

Particle size and concentration measurements. Indoor air quality assessment.

Environmental Engineering 651 3 units; H(3-0)

Advanced Topics in Solid Waste Engineering
Analysis and implementation of solid waste minimization strategies. Aerobic biological treatment of waste. Landfill bioreactors for energy recovery. Performance-based design of landfills, soil-chemical interactions and implications. Leachate migration in unsaturated/saturated zones. Design and construction of barrier systems. Leachate collection systems. Landfill closure issues. Life cycle assessment of waste management systems.

Environmental Engineering 653 3 units; H(3-0) (Civil Engineering 747)

Contaminated Soil Remediation
Overview of soil remediation engineering. Contaminant partitioning in air, water and gas phases. Phases of site assessments, Physical and chemical treatment processes, soil vapour extraction, air sparging, soil washing, soil flushing, thermal desorption and incineration, solidification and stabilization, vitrification, biological treatment processes, bioremediation kinetics, ex situ and in situ techniques. Liquid phase bioremediation as it pertains to soil remediation.

Antirequisite(s): Credit for Environmental Engineering 653 and Civil Engineering 747 will not be allowed.

Environmental Engineering 655 3 units; H(3-0) (Civil Engineering 745)

Hazardous Waste and Contaminated Sites Management
Integrated waste management. Functional and fundamental properties of hazardous waste. Toxicological properties of contaminants. Contaminant release mechanisms. Fate and transport of contaminants in the environment. Contaminated site assessment principles. Quantitative human health risk assessment (QHHRA) as applied to contaminated sites. Hazard identification, exposure pathway analysis, risk characterization. Risk management and site remediation. Methods of hazardous waste treatment and contaminated site remediation. Secure land disposal of hazardous waste and contaminated soils and sludges.

Antirequisite(s): Credit for Environmental Engineering 655 and Civil Engineering 745 will not be allowed.

Environmental Engineering 661 3 units; H(3-0) (Chemical Engineering 645)

Industrial and Produced Wastewater Treatment
Sources and characterization of industrial wastewater. Treatment objectives and regulations. Unit and process design. Physical/chemical treatment including sedimentation, coagulation, filtration, absorption, adsorption, ion exchange, membrane processes and pH adjustment.

Antirequisite(s): Credit for Environmental Engineering 661 and Chemical Engineering 645 will not be allowed.

Environmental Engineering 663 3 units; H(3-0) (Civil Engineering 741)

Biological Processes for Wastewater Treatment
Specialized biological wastewater treatment processes for removal of impurities not effectively removed by conventional secondary wastewater treatment systems, such as nutrients (e.g. nitrogen and phosphorus), residual organics, residual solids, bacteria and viruses. Wetlands. Activated sludge modelling. Biological nutrient removal. Sludge management. Disinfection.

Antirequisite(s): Credit for Environmental Engineering 663 and Civil Engineering 741 will not be allowed.

Environmental Engineering 665 3 units; H(3-0) (Chemical Engineering 665)

Wastewater Issues for the Oil and Gas Industry
Produced water characteristics, regulations governing produced water management, management options. Technologies used for produced water treatment, novel/emerging technologies. Process design approaches and comparative evaluation of various technologies. Case Studies.

Antirequisite(s): Credit for Environmental Engineering 665 and Chemical Engineering 665 will not be allowed.

Environmental Engineering 671 3 units; H(3-0)

Energy and Environment
Introduction to formation, extraction, transportation and conversion of fossil fuels; electricity generation, transmission and distribution; thermal power and cogeneration; nuclear power; renewable energy sources; energy efficiency and conservation; exergy analysis; greenhouse gas emissions; air, land and water pollution and their mitigation.

Environmental Engineering 673 3 units; H(3-0) (Mechanical Engineering 637)

Thermal Systems Analysis
Fundamentals of thermodynamics, fluid mechanics and heat transfer; thermal and energy systems, heat exchangers, co-generation; Second law of thermodynamics and concept of entropy generation and thermo-economics; Environmental issues and pollution control; Renewable energy system; Co-generation design; Heat exchanger design; Energy storage systems; Optimization process.

Antirequisite(s): Credit for Environmental Engineering 673 and Mechanical Engineering 637 will not be allowed.

Environmental Engineering 681 3 units; H(0-6)

Project in Environmental Engineering I
Allows course-based MEng degree students with the opportunity of pursuing advanced studies or a design project in environmental engineering under the direction of one or more faculty members, which must be arranged and approved prior to registration. A written proposal, progress reports, and a final report are required.

Prerequisite(s): Consent of the Centre.

Antirequisite(s): Credit for Environmental Engineering 681 and 682 will not be allowed.

Note: Available to course-based MEng degree students only after completing most other courses for the degree.

Environmental Engineering 682 6 units; F(0-6)

Project in Environmental Engineering II
Allows course-based MEng degree students with the opportunity to work on a comprehensive research or design project under the supervision of one or more faculty members, which must be arranged and approved prior to registration. A written proposal, progress reports, and a final report are required.

Prerequisite(s): Consent of the Centre.

Antirequisite(s): Credit for Environmental Engineering 682 and 681 will not be allowed.

Note: Available to course-based MEng degree students only after completing most other courses for the degree.

Environmental Engineering 691 3 units; H(3-0)

Environmental Policy Analysis
An examination of the policy tools used in decision-making related to the environment, the course aims to facilitate dialogue between political scientists and engineers. Topics include: risk analysis; decision analysis; uncertainty assessment; and benefit-cost analysis. The structure and evolution of environmental regulation will be used as a theme with an emphasis on energy.

Antirequisite(s): Credit for Environmental Engineering 691 and Political Science 755.31 will not be allowed.

Environmental Engineering 693 3 units; H(3-0)

Life Cycle Assessment
Concepts of life cycle assessment. Consideration of environmental and economic impacts from the extraction of resources to the disposal of unwanted residuals. Review and evaluation of tools and frameworks (e.g. process, input-output, hybrid life cycle assessment). Relative merits of various methods for interpreting and valuing the impacts. Examples of applications in environmental engineering and the energy industry.

Antirequisite(s): Credit for Environmental Engineering 693 and Environmental Design 683.85 will not be allowed.

Environmental Science ENSC

Instruction offered by members of the Faculty of Science and the Faculty of Arts.

Limited amounts of non-scheduled class time involvement will be required for these courses.

Senior Courses

Environmental Science 401
3 units; H(160 hours)

Environmental Science Field Course I
This course introduces the common field techniques in quantifying air, land and water quality, as well as data analysis and report writing. A field portion is held in the two weeks prior to the start of the regular Fall Term, partly based at the Biogeoscience Institute's Barrier Lake Field Station.

Prerequisite(s): Geography 339 or Biology 315 or Statistics 327 or equivalent and admission to the Environmental Science program.

Note: A supplementary fee will be assessed to cover additional costs associated with this course.

Environmental Science 501
3 units; H(160 hours)

Environmental Science Field Course II
The focus will be on disturbances to aquatic and terrestrial ecosystems. Site visits and data collection will be conducted to appropriate areas that have either undergone or are undergoing industrial disturbance to assess impacts. The course is held for two weeks immediately prior to the start of the regular Fall Term.

Prerequisite(s): Environmental Science 401 and admission to the Environmental Science program.

Note: A supplementary fee will be assessed to cover additional costs associated with this course.

Environmental Science 502 6 units; F(3-0)

Special Problems in Environmental Management
Surveys many aspects of the professional practice of environmental science including: environmental management, audit and accounting, law and regulation, life cycle assessment, ethics and philoso-

phy, toxicology and epidemiology, and remediation and reclamation technologies. Includes a major collaborative research project on a local environmental issue.

Prerequisite(s): Admission to the Environmental Science program.

Corequisite(s): Prerequisite or Corequisite: Environmental Science 401.

Environmental Science 503 **3 units; H(3-0)**

Environmental Assessment and Hearings
This course formally introduces students to federal and provincial environmental impact assessment (EIA), which is implicit in much of Environmental Science 401, 501 and 502.

Prerequisite(s): Admission to the Environmental Science program.

Environmental Science 504 **6 units; F(0-9)**

Research Project in Environmental Science
An independent study or research project under the supervision of one or more faculty members in the Environmental Science program. Originality is emphasized and laboratory and/or field studies are encouraged. Formal written and oral reports will be presented as a necessary component of this course.

Prerequisite(s): Consent of the Environmental Science Program Director.

MAY BE REPEATED FOR CREDIT

Environmental Science 505 **3 units; H(0-9)**

Special Problems in Environmental Science
A research project under the supervision of one or more faculty members in the Environmental Science program. Formal written and oral reports will be presented as a necessary component of this course.

Prerequisite(s): Consent of the Environmental Science Program Director.

MAY BE REPEATED FOR CREDIT

Film FILM

Instruction offered by the Department of Communication, Media and Film Studies in the Faculty of Arts.

Junior Courses

Film 201 **3 units; H(1-3-1T)**

Introduction to Film Studies
An introduction to the main issues involved in studying and analysing film including medium, story, photography, mise-en-scene, movement, editing, sound, and acting. Intended to prepare students for further work in film studies.

Antirequisite(s): Credit for Film 201 and 200 will not be allowed.

Film 203 **3 units; H(2-3)**

Introduction to Research in Film Studies
An in-depth introduction to conducting research in film studies, emphasizing critical viewing, reading and writing through the examination of a specific topic, such as a film genre, a national cinema, or a filmmaker.

Corequisite(s): Prerequisite or Corequisite: Film 201.

Note: Recommended for (but not limited to) students who intend to Major or Minor in Film Studies.

Senior Courses

Film 301 **3 units; H(2-3)**

Topic in National Cinema
Topics will explore various aspects of, or historical moments in, a particular nation's cinematic culture. Topics might include Quebecois cinema, current British cinema, German cinema Between the Wars, Canadian cinema, the History of Chinese cinema, etc.

MAY BE REPEATED FOR CREDIT

Film 305 **3 units; H(2-3)**

Topic in Genre
Topics will focus on the style, narrative form, and historical evolution of selected genres, for example, the Documentary, the Western, the Melodrama, the Musical, etc.

MAY BE REPEATED FOR CREDIT

Film 307 **3 units; H(2-3)**

Topic in Cinema and Gender Studies
Topics will explore the representation of gender and sexuality in cinema. Topics might include: Images of Women in the American 1940s, Lesbian Images in Current Cinema, The Queer 1950s, Comparative Images of Women in American and French Cinema, etc.

MAY BE REPEATED FOR CREDIT

Film 321 **3 units; H(2-3)**

History of Popular Cinema
An assessment of the various ways in which the history of film production can be approached, including the development of filmmaking technologies, evolutions in cinematic style and narrative traditions, particularly as they relate to popular cinema, and changing industrial practices.

Prerequisite(s): Film 201.

Note: This course may not be offered every year.

Film 323 **3 units; H(2-3)**

Issues in Film History
An introduction to key concepts in cinematic historiography. Emphasis will be placed upon non-traditional or non-canonical films and their relationship to dominant histories of filmmaking.

Prerequisite(s): Film 201.

Note: This course may not be offered every year.

Film 331 **3 units; H(2-3)**

Film Theory up to 1950
An introduction to theoretical perspectives on film before the mid twentieth century. Connects film with broader debates on aesthetics, medium specificity, genre, and realism. Includes theories developed in the first half of the twentieth century related to Silent Film, Formalism, Montage, Critical Theory, and Auteur theories.

Prerequisite(s): Film 201.

Antirequisite(s): Credit for Film 331 and 300 will not be allowed.

Film 333 **3 units; H(2-3)**

Film Theory after 1950
An introduction to theoretical perspectives on film developed since the mid-twentieth century, specifically Structuralism, Linguistics, Psychoanalysis, Feminism, Post-structuralism, Cultural Studies, Post-colonialism and Queer Theory.

Prerequisite(s): Film 201.

Antirequisite(s): Credit for Film 333 and 300 will not be allowed.

Film 351 **3 units; H(2-3)**

Canadian Film
An introduction to key historical and theoretical aspects of Canadian film. Topics will include the study of Canadian film auteurs, documentary and social change, feature film genres, and the role of government regulations. Students will explore the central themes and issues facing Canadian filmmakers and audiences.

Antirequisite(s): Credit for Film 351 and Canadian Studies 331 will not be allowed.

Film 401 **3 units; H(2-3)**

Topic in Film Theory
Topics will be organized around particular theorists, schools of theory, historical issues in film culture, or contemporary thought on film. Topics may include: Psychoanalysis and/as Film Theory; Kaja Silverman and Teresa de Lauretis; Modernism and Postmodernism; Feminist Film Theory; Queer Theory and Film; Postcolonial Theory and Film; Semiotics.

Prerequisite(s): Film 331 or 333.

MAY BE REPEATED FOR CREDIT

Film 403 **3 units; H(2-3)**

Topic in the Director's Cinema
Topics will examine the distinctive style and concerns of a particular director or directors.

Prerequisite(s): Film 201.

MAY BE REPEATED FOR CREDIT

Film 405 **3 units; H(2-3)**

Advanced Topic in Film Genre
Topics will be organized around a specific film generic tradition.

Prerequisite(s): Film 201 and one of 305 or 321.

MAY BE REPEATED FOR CREDIT

Film 407 **3 units; H(0-4)**

Experiential Learning in Film
This course is designed to provide students with the opportunity to combine interests in film studies research with experiential learning opportunities in the community and workplace (internships, paid employment, approved film production training or volunteer position).

Prerequisite(s): Film 201, admission to the BA in Film Studies or the Bachelor of Film Studies and consent of the Department.

Film 409 **3 units; H(2-3)**

Special Topic in Film Studies
See Schedule of Classes for current topic(s).

Prerequisite(s): One of Film 321, 331 or 333.

MAY BE REPEATED FOR CREDIT

Film 441 **3 units; H(2-3)**

The Film Festival
An exploration of the social practices (cultural tourism, tastemaking, identity formation, celebrity and star formation) and operational aspects (marketing, promotion, jurying, lobbying, audience cultivation) of film festivals. Students will be encouraged to participate in community service learning through volunteer opportunities with a particular festival.

Prerequisite(s): Film 321.

Film 451 **3 units; H(2-3)**

The Canadian Film Industry: National and Global Perspectives
A study of the nature of the Canadian film industry. Emphasis will be on the evolution of the Canadian

motion picture industry in the twentieth century and how it is situated in contemporary popular culture. Other topics include Canada's historic relationship to Hollywood, the audience for Canadian films, the role of the state in funding, distribution and production systems, the impact of new technologies, and how the structure of Canada's film industry compares with those of other countries.

Prerequisite(s): 3 units of Film, Communication and Media Studies, or Canadian Studies at the 300 level.

Film 461 **3 units; H(2-3)**

Film Audience and Reception
The course maps aspects of spectatorship, audience, and reception approaches as they intersect with the experience and study of cinema. The course provides students with tools to appreciate film as an interactive medium of communication. It explores these approaches with emphasis on spectatorial agency, resistant and subversive reading, and hegemonic and counter-hegemonic readership and production.

Prerequisite(s): One of Film 321, 331 or 333.

Film 471 **3 units; H(2-3)**

Experimental Film and Video
The course explores the genre of experimental film and video. Particular emphasis will be given to the history and evolution of works in this genre with attention to Canadian contributions and the impact of digital and new media.

Prerequisite(s): One of Film 321, 331 or 333.

Film 501 **3 units; H(0-1T)**

Research in Selected Topics in Film Studies
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Department.

Note: Students who wish to propose a topic must secure a supervisor among the Film instructors and have the topic approved by the Department at least two weeks prior to the first day of classes.

MAY BE REPEATED FOR CREDIT

Film 509 **3 units; H(2-3)**

Advanced Special Topics in Film Studies
See Schedule of Classes for current topic(s).

Prerequisite(s): 6 units of Film at the 400 level.

MAY BE REPEATED FOR CREDIT

Film 590 **6 units; F(3S-0)**
(formerly Communication and Culture 590)

Honours Thesis
Supervised individual research and preparation of an Honours thesis.

Prerequisite(s): Admission to the Honours program and consent of Honours Program Coordinator.

Film 591 **3 units; H(2-3)**

Senior Seminar in Film Studies
With reference to a specific topic, this course explores the variety of ways in which film and the technologies of motion pictures connect with social life. Students will undertake a major project that will integrate their understanding of film theory, history, and genres. See individual course outlines for current topics.

Prerequisite(s): Admission to the BA in Film Studies and 78 units (13.0 full-course equivalents), of which, 6 units (1.0 full-course equivalent) must be taken from Film 321, 323, 331, or 333.

Graduate Courses

For graduate courses, please see the listing in the Communication and Media Studies (COMS) section.

Finance FNCE

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Finance 317 **3 units; H(3-3T)**

Financial Management
Broad-based introduction to financial management. Builds on a modern understanding of how risk, time horizon, and market equilibrium or imperfections each affect valuation, investment and financing decisions. Main topics include an introduction to no-arbitrage pricing, financial options, valuation of real and financial assets, and theories of capital markets and capital structure.

Prerequisite(s): Admission to the Haskayne School of Business, 30 units (5.0 full-course equivalents) including Mathematics 249 or 251 or 265 or 281, Economics 201 and 203, Statistics 213 and 217, Accounting 217 or 317, and Business and Environment 291 or Management Studies 217.

Antirequisite(s): Credit for Finance 317 and either 341 or 343 will not be allowed.

Finance 341 **3 units; H(3-1T)**

Canadian Business Finance
An introduction to business financial management practices in Canada including investment decision, capital markets, and sources, uses and costs of capital over short, intermediate and long run situations.

Prerequisite(s): 30 units (5.0 full-course equivalents).

Antirequisite(s): Credit for Finance 341 and 317 will not be allowed.

Note: Not available for credit toward the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Finance 343 **3 units; H(3-2T)**

Personal Financial Management
An introduction to personal financial management practices in Canada. Topics discussed may include goal setting, personal financial statements, the mathematics of personal finance, taxation, general and life insurance, retirement planning, investments, and estate planning. Completion of the course should enable students to properly prepare and plan their own financial future.

Prerequisite(s): 30 units (5.0 full-course equivalents).

Antirequisite(s): Credit for Finance 343 and either 317 or 477 will not be allowed.

Note: Not available for credit toward the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Finance 443 **3 units; H(3-0)**

Security Analysis and Investments
Techniques and theories used in selecting securities for various investment objectives. Evaluation of risks and opportunities with respect to purchase, sale, or retention of investments.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 445 **3 units; H(3-0)**

Futures and Options
A study of financial contracts for which the payoffs are contingent upon or derived from the value pre-specified underlying economic variables. Typical underlying variables include the spot price of a commodity and the price of a stock. These contracts are used extensively for hedging and speculative purposes. They also provide useful information about forecasts of the underlying economic variable in a process called "price discovery."

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 447 **3 units; H(3-0)**

Capital Budgeting
Capital investment policies, real options, required rate of return calculation, tax factors, risk analysis, buy versus lease, abandonment considerations.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 449 **3 units; H(3-0)**

Trading and Market Data Management
Introduces students to accessing data feeds as they are used by professional financial market traders and analysts. Data for stock, bond, futures and options markets, accounting statements and securities commission filings, as well as real-time and historical news events and analysis will be studied.

Prerequisite(s): Admission to the Haskayne School of Business, Finance 317 and consent of the Haskayne School of Business.

Antirequisite(s): Credit for Finance 449 and Management Studies 559.15 will not be allowed.

Note: Enrolment is strictly limited by the Haskayne School of Business.

Finance 451 **3 units; H(3-0)**

Advanced Financial Management
Focuses on understanding the advanced theories and practices of financial management that are required for finance majors. Topics include market imperfections arising from asymmetric information and taxation. It applies these concepts to study incentives and conflicts in various financial agent pairings. These concepts are then used in a theoretical and empirical study of important financial decisions, such as capital structure, dividend policy, retained ownership, security underwriting, management of distressed firms, managerial compensation, corporate governance and mergers.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 461 **3 units; H(3-0)**

International Finance
A study of the forces affecting the financial environment of the corporate sector which appear to stem from requirements in the international sector. Balance-of-payments problems, exchange rates, currency risk hedging techniques, international reserve creations and transfers are some of the major elements studied.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 463 **3 units; H(3-0)**

Portfolio Theory and Management
Analysis of the major aspects of the grouping of financial assets. Portfolio analysis and its application to portfolio management, capital market

theory and the measurement of financial performance in the presence of risk.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 465 **3 units; H(3-1T)**

Mergers and Acquisitions
A study of the economic theory and practical issues around takeover and takeover defence strategies. Valuation issues, corporate restructuring, corporate governance, and methods of ensuring congruence between management and shareholder goals are also discussed.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Antirequisite(s): Credit for Finance 465 and 559.01 will not be allowed.

Finance 467 **3 units; H(3-1T)**

Financial Risk Management
A framework for evaluating financial risks and managing them with the use of financial securities including derivatives. Includes firm valuation with risk management, value-at-risk, testing financial models, optimal hedging strategies, energy risk management, market risk, static versus dynamic strategies, interest rate risk, credit risk and liquidity risk. Case analysis of financial disasters due to risk management failures.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 471 **3 units; H(3-0)**
(formerly Finance 470)

The Calgary Portfolio Management Trust
A comprehensive hands-on review of the modern theories and applications of portfolio management. Students will be responsible for completing the fiduciary duties of an actual fund manager, reporting to a Board of Trustees. Topics may include: selecting securities, hedging with covered options, benchmarking a portfolio, financial reporting, evaluation of risk, risk/return tradeoffs and management.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Note: Enrolment is strictly limited by the Haskayne School of Business and the student must be in the BComm program.

Finance 473 **3 units; H(3-0)**

New Venture Finance
Application of financial theory and analysis to the valuation and financing of new ventures. Course balances learning of concepts, development of analytical skills, and practice in decision making. Opportunity to apply learning to live projects.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 475 **3 units; H(3-1T)**

Management of Financial Institutions
Management of funds and their allocation among cash, primary reserves, loans and investments to provide liquidity and earnings. Services to depositors. Consideration of factors involved in the lending decision, pricing of services, branch location, etc. Strategies for maintaining profitability and liquidity in the face of changing monetary policy.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 477 **3 units; H(3-3T)**
(formerly Management Studies 577)

Personal Financial Management in Canada
An introduction to personal financial management in Canada. Topics covered may include goal setting, personal financial statements analysis, the time value of money, the Canadian personal income tax system, taxation issues for small businesses, risk management, an introduction to investments, retirement planning and estate planning. Students will be expected to display a comprehensive knowledge of the tools necessary to complete their own personal financial plan.

Prerequisite(s): Admission to the Haskayne School of Business and 84 units (14.0 full-course equivalents) including Finance 317.

Antirequisite(s): Credit for Finance 477 and 343 or Management Studies 559.03 will not be allowed.

Note: This course may not be used towards the Finance concentration.

Finance 479 **3 units; H(3-0)**

Corporate Risk Management
Introduction to the management of operational and hazard risks based on contemporary financial theories, including risk identification, loss estimation, risk control, risk financing with insurance and other techniques, and enterprise risk management.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

Finance 559 **3 units; H(3-1T)**
(formerly Finance 595)

Selected Topics in Financial Management
Investigation of selected topics related to financial management, emphasizing the application of financial management principles to actual problems in the corporate sector.

Prerequisite(s): Admission to the Haskayne School of Business and Finance 317.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Finance 601 **3 units; H(3-0)**

Managerial Finance
The major decision-making areas confronting modern financial managers today. Provides a general understanding of financial markets and how they can be used for personal finance. Covers traditional subjects such as capital budgeting, net present value, risk/return, capital structure and dividend policy. Topical areas covered are IPOs, mergers and acquisitions, derivatives and options. The course is integrated with current events from the financial world.

Prerequisite(s): Accounting 601.

Finance 745 **3 units; H(3-0)**

Futures and Options
After presenting basic definitions, institutional details, and strategies, a general theory of derivative pricing based on the principle of No Arbitrage will be developed. This theory will then be applied to the basic derivative contracts (futures, forwards, put options and call option) as well as exotic options. Using the binomial model, as well as the continuous time model of Black Scholes, hedging and replication will also be examined.

Prerequisite(s): Finance 601.

Finance 751 **3 units; H(3-0)**

Advanced Topics in Financial Administration
Classical and contemporary topics in the theory and practice of financial management including capital structure, cost of capital, real options valuation, bankruptcy costs and debt holder-equity holder conflicts, corporate financial strategy, managerial incentives and financial decisions, information conveyed by financial decisions, and mergers and acquisitions.

Prerequisite(s): Finance 601.

Finance 753 **3 units; H(3-0)**

Problems in Financial Management
The application of financial management principles to actual problems mainly in the corporate sector, including such areas as working capital, management, short, intermediate and long-term financing problems, dividend policy and reorganization.

Prerequisite(s): Finance 601.

Finance 755 **3 units; H(3-0)**

Capital Budgeting
Capital investment policies, real options, required rate of return calculation, tax factors, risk analysis, buy versus lease, abandonment considerations.

Prerequisite(s): Finance 601.

Finance 757 **3 units; H(3-0)**

Management of Financial Institutions
Financial intermediaries such as banking and brokerage. Explains the risks faced by institutions and the integration through modern financial markets. Covers issues such as lending, trading, securitization, deposit insurance and the regulatory environment. Concludes with modern bank management from the shareholder value point of view.

Prerequisite(s): Finance 601.

Finance 759 **3 units; H(3-0)**

Investment and Portfolio Management
Theory and analysis of investment and portfolio management decisions. Evaluation of performance of individual and professional investors and portfolio managers.

Prerequisite(s): Finance 601.

Finance 765 **3 units; H(3-0)**

Mergers and Acquisitions
A study of economic theory and practical issues around takeover strategies, and takeover defence strategies. Valuation issues, corporate restructuring, corporate governance, and methods of ensuring congruence between management and shareholder goals are also discussed.

Prerequisite(s): Finance 601.

Finance 767 **3 units; H(3-0)**

Financial Risk Management
A framework for evaluating financial risks and managing them with the use of financial securities including derivatives. Includes firm valuation with risk management, value-at-risk, testing financial models, optimal hedging strategies, energy risk management, market risk, static versus dynamic strategies, interest rate risk, credit risk and liquidity risk. Case analysis of financial disasters due to risk management failures.

Prerequisite(s): Finance 601.

Finance 785 **3 units; H(3-0)**

New Venture Finance
Problems of valuing and financing new ventures. Emphasis on financial theory, best practices and modelling of new ventures. Case studies and opportunities to develop detailed financial plan for live new venture.

Prerequisite(s): Finance 601 or consent of the Haskayne School of Business.

Finance 789 **3 units; H(3S-0)**

Seminar in Financial Management
Intensive study and discussion of current literature and research with respect to selected, advanced topics in Finance.

MAY BE REPEATED FOR CREDIT

Finance 795 **3 units; H(3-0)**

International Finance
A study of the international financial environment and the issues firms face when operating in this environment. Currency regimes, currency crises, balance of payments, exchange rate and interest rate parity conditions, supernational agencies, political risks, management of foreign exchange exposure are some of the major topics studied.

Prerequisite(s): Finance 601.

Finance 797 **3 units; H(3S-0)**

Advanced Seminar in Finance
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

PhD Course

Finance 799 **3 units; H(3S-0)**

Doctoral Seminars in Finance
799.01. Theory of Finance

799.02. Empirical Methods in Finance

799.03. Topics in Finance

799.04. Financial Engineering

799.05 Theory of Corporate Finance

799.06 Asset Pricing

799.07 Topics in Asset Pricing and Corporate Finance

Fine Arts FINA

Instruction offered by the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Junior Course

Fine Arts 201 **3 units; H(3-0)**

Introduction to the Fine Arts
A survey of major issues in the fine arts. An overview of the interactions among the arts; the arts and society; an introduction to criticism and aesthetics; technical aspects of the individual arts.

Senior Courses

Fine Arts 501 **3 units; H(3-0)**

Topics in Fine Arts: Comparative Studies and Critical Theory
Topics may include aesthetic theory, theory and/or history of collaborative arts, critical theory, and the history of criticism.

Prerequisite(s): One full senior course in any of Art, Dance, Drama or Music or consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Fine Arts 503 **3 units; H(2-2)**

Topics in Fine Arts: Collaborative Production Projects
An experiential learning course, in which students collaborate to produce works combining elements from among the programs in studio art, acting and directing, design, dance, music composition and performance.

Prerequisite(s): One full senior course in any of Art, Dance, Drama or Music or consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Fine Arts 507 **3 units; H(0-3)**

Topics in Interdisciplinary Multi-Media Research
Instruction in the creation of interdisciplinary artworks (including performance, installation and computer projection).

Prerequisite(s): Fine Arts 201 or consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Fine Arts 601 **3 units; H(0-3)**

Studies at the Banff Centre
Interdisciplinary fine arts studies. Although the Banff Centre does not provide credit course instruction, students with advanced experience in art, dance, drama or music at the Banff Centre may apply for graduate-level credit from the University of Calgary.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Fine Arts 603 **3 units; H(3-0)**

Topics in Fine Arts: Interdisciplinary Seminar
Interdisciplinary seminar in the advanced study and interpretation of the interrelationships between music, the fine arts, and the history of ideas, using a theme-oriented approach.

Note: This is a required course in the PhD program for Music Education, Composition and Musicology.

MAY BE REPEATED FOR CREDIT

Fine Arts 607 **3 units; H(3-0)**

Topics in Multi-Media Research
Concentrated instruction in computer applications in the Fine Arts.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

French FREN

Programme offert par le Département d'études françaises, italiennes et espagnoles de la Faculté des Arts.

Il est recommandé aux étudiants de consulter le Département à chaque étape de la planification de leur programme.

Les étudiants de langue maternelle française, italienne et espagnole et ceux dont le niveau d'études dans ces langues est supérieur à celui du diplôme de fin d'études secondaires (y compris les étudiants provenant d'un programme bilingue ou d'immersion) doivent obligatoirement consulter le Département pour se faire diriger ver le(s) cours conforme(s) à leur niveau. Les locuteurs natifs ne peuvent se faire créditer des cours de langue ni par équivalence ("advanced credit") ni par évaluation spéciale ("special assessment").

Certains cours intermédiaires et avancés ne sont pas offerts tous les ans. Pour les cours proposés pendant l'année en cours, prière de se reporter à l'horaire général de l'Université.

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Arts.

Students are encouraged at all times to seek departmental guidance in planning any aspect of their programs.

French, Italian and Spanish-speaking students or students with some prior knowledge of the language (including graduates of a bilingual or immersion program) must consult the Department to be placed in a course corresponding to their level of linguistic competence. Native speakers are not eligible to take language courses by special assessment or to receive advanced credit for them.

Not all senior courses are offered every year. Current course offerings are listed in the Schedule of Classes.

Junior Courses

French 209 **3 units; H(3-1)**

Beginners' French I
Basic elements of the French language, including training in comprehension, speaking, reading and writing of French.

Antirequisite(s): Credit for French 209 and any of 20, 30, or 31 will not be allowed

Note: Students starting in French 209 must complete at least 54 units (9.0 full-course equivalents) to fulfill the requirements for French Majors as specified in Faculty of Arts section 4.28.1.

French 211 **3 units; H(3-1)**

Beginners' French II
A continuation of French 209.

Prerequisite(s): French 20 or French 209.

Antirequisite(s): Credit for French 211 and either 30 or 31 will not be allowed.

Note: Students starting in French 211 must complete at least 51 units (8.5 full-course equivalents) to fulfill the requirements for French Majors as specified in Faculty of Arts section 4.28.1.

French 213 **3 units; H(3-1)**

Intermediate French
Further development of abilities in spoken and written French. Review of French grammar along with extensive oral and written practice.

Prerequisite(s): French 211, French 30, French N30.

Antirequisite(s): Credit for French 213 and any of 215, 217 or 225 will not be allowed.

French 225 **3 units; H(3-1)**

La Grammaire par les textes I
Apprentissage des structures grammaticales et logiques du français contemporain avec lectures de morceaux choisis de textes de la francophonie mondiale.

Prerequisite(s): Prérequis: French 30N ou 30S ou 31 (ou équivalents), ou French Language Arts 30, ou French 213.

Antirequisite(s): Anti-prérequis: Les étudiants qui ont pris le cours French 315 ne peuvent s'inscrire en French 225.

French 227 **3 units; H(3-1)**

La Grammaire par les textes II
Suite du cours French 225 et mise en pratique des structures acquises.

Prerequisite(s): Prérequis: French 225.

Antirequisite(s): Anti-prérequis: Les étudiants qui ont pris French 315 ou 317 ne peuvent s'inscrire en French 227.

French 291 **3 units; H(3-0)**

Francophonie: Langue et Culture I
Étude de la langue et de la culture des pays francophones, y compris la France, le Canada et les pays de l'Afrique, de l'Asie et des Caraïbes. Introduction aux sources et aux outils de recherche nécessaires pour cette étude et pour la production de travaux écrits et oraux.

Prerequisite(s): Prérequis: French 30N ou 30S ou 31 (ou équivalents), ou French Language Arts 30, ou French 213.

Antirequisite(s): Anti-prérequis: Les étudiants qui ont pris le cours French 215 ne peuvent s'inscrire en French 291.

Senior Courses

Ne sont admis aux cours avancés que les étudiants qui possèdent déjà une connaissance suffisante de la langue française. En cas de doute, prière de consulter le Département.

Senior courses are open only to students who have a sufficient knowledge of French. Students who are in doubt about their level of knowledge should consult the Department.

French 329 **3 units; H(3-0)**

Expression écrite et orale
Grammaire avancée. Perfectionnement de techniques d'expression écrite et orale.

Prerequisite(s): Prérequis: French 227.

Antirequisite(s): Anti-prérequis: Les étudiants qui ont pris le cours French 415 ne peuvent s'inscrire en French 329.

French 339 **3 units; H(3-0)**

Concepts littéraires
Concepts fondamentaux de l'analyse littéraire. L'accent sera placé principalement sur les traditions littéraires des pays francophones. Initiation à l'utilisation de sources bibliographiques particulières à l'étude de la littérature de langue française.

Prerequisite(s): Prérequis: French 227.

French 343 **3 units; H(3-2)**

Cinéma de langue française
Introduction à l'analyse de films en français.

Prerequisite(s): Prérequis: French 227.

French 353 **3 units; H(3-0)**
(Anciennement French 359)

Histoire littéraire
Aperçu chronologique des périodes, mouvements et écoles des littératures de langue française, accompagné d'études de textes.

Prerequisite(s): Prérequis: French 227.

French 369 **3 units; H(3-0)**

Introduction à la linguistique française
Initiation à l'approche scientifique (objective et systématique) du langage humain. Fonctions du langage et rôle des linguistes. Concepts de base de la linguistique: langage, langue, parole; synchronie vs diachronie; signifiant vs signifié; paradigmatique vs syntagmatique; double articulation; phonèmes, monèmes. Différents domaines de la linguistique.

Prerequisite(s): Prérequis: French 227.

French 391 **3 units; H(3-0)**

Francophonie: langue et culture II
Étude de la langue française et de la culture des pays de la francophonie: France, Canada, pays d'Afrique, des Caraïbes et d'Asie. Recherche documentaire et production de textes écrits.

Prerequisite(s): Prérequis: French 227.

French 393 **3 units; H(3-0)**

Français professionnel
Cours de langue française sur objectifs spécifiques et à visée professionnelle. Idéal pour les domaines aussi variés que les affaires, le tourisme, le droit, la médecine, les sciences, les relations internationales, la traduction, etc. Le format et le contenu peuvent varier d'une année à l'autre.

393.01 Français professionnel: les affaires

393.02 Français professionnel: le tourisme

393.03 Français professionnel: l'éducation

393.04 Français professionnel: les relations internationales

393.05 Français professionnel: la médecine et les sciences

393.06 Français professionnel: l'ingénierie

Prerequisite(s): Prérequis: French 227.

Note:

French 399 **3 units; H(3-0)**

Langue française, littérature et culture
Étude des aspects de la langue française, de la littérature et de la culture. Les supports utilisés incluent les textes authentiques, la BD, la chanson, les media, etc. Exemples de sujets traités: le monde francophone, l'histoire de la langue française, etc. Le format et le contenu peuvent varier d'une année à l'autre.

399.02 Immersion à Montréal/Québec

399.04 L'histoire de la langue française

399.08 Expression et compréhension orale et écrite

399.09 Littérature et culture de la renaissance française

399.10 Le monde francophone

Prerequisite(s): Prérequis: French 227.

French 439 **3 units; H(3-0)**

Le Canada francophone
Panorama de la littérature canadienne de langue française.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

French 449 **3 units; H(3-0)**

Littératures francophones
Panorama des productions littéraires de langue française en Afrique, au Maghreb et aux Antilles.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

French 453 **3 units; H(3-0)**

Littérature du Moyen-Âge et de la Renaissance
Panorama de la littérature française du Moyen-Âge et de la Renaissance.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

French 455 **3 units; H(3-0)**

Littérature du 17e siècle
Panorama de la littérature française du 17e siècle.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

French 457 **3 units; H(3-0)**

Littérature du 18e siècle
Panorama de la littérature française du 18e siècle.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

French 459 **3 units; H(3-0)**

Littérature du 19e siècle
Panorama de la littérature française du 19e siècle.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

French 463 **3 units; H(3-0)**

Littérature des 20e-21e siècles
Panorama de la littérature française des 20e-21e siècles.

Prerequisite(s): Prérequis: French 329, plus 339, six unités (deux autres demi-cours) de français de niveau 300.

French 489 **3 units; H(3-0)**

Aspects de la linguistique française
Étude des différents aspects de la langue française. Méthodes d'analyse et de description. Le format et le contenu peuvent varier d'une année à l'autre.

489.01. Phonologie

489.02. Morphologie

489.03. Syntaxe

489.04. Sémantique

489.05. Lexicologie

Prerequisite(s): Prérequis: French 369 plus six unités (deux autres demi-cours) de français de niveau 300.

Note: Remarque: Les étudiants qui ont pris le cours French 349 ne peuvent s'inscrire en French 489.01 (Phonologie).

French 499 **3 units; H(3-0)**

Langue française, littérature et culture II
Étude des aspects de la langue française, de la littérature et de la culture. Les thèmes de ce cours seront abordés à l'aide de méthodes novatrices.

Prerequisite(s): Prérequis: French 329, plus six unités (deux autres demi-cours) de français de niveau 300.

MAY BE REPEATED FOR CREDIT

French 511 **3 units; H(3-0)**

Théories critiques
Présentation de certaines théories contemporaines qui ont cours en études littéraires et culturelles. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

Note: Remarque: Ce cours est obligatoire pour les étudiants inscrits au programme du baccalauréat spécialisé ("Honours") de français.

MAY BE REPEATED FOR CREDIT

French 525 **3 units; H(0-3T)**

Études indépendantes: apprentissage expérientiel
Stage de recherche sous la direction de professeurs du Département ou stage en milieu francophone. Rapport de fin de stage rédigé en français.

Prerequisite(s): Prérequis: Autorisation du Département après remise par l'étudiant d'une proposition écrite avant le 1er décembre précédant immédiatement le cours.

Note: Remarque: Ce cours sera offert en hiver seulement pour permettre aux étudiants (a) de prendre les dispositions nécessaires avant le 1er décembre et (b) de recevoir l'approbation du Département.

NOT INCLUDED IN GPA

French 539 **3 units; H(3-0)**

Étude spécialisée du Canada français
Séminaire sur des sujets avancés dans le domaine de la langue, de la littérature ou de la culture du Canada français. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

MAY BE REPEATED FOR CREDIT

French 543 **3 units; H(3-2)**

Étude spécialisée du Cinéma de langue française
Séminaire sur des sujets avancés ayant trait au cinéma de langue française. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

MAY BE REPEATED FOR CREDIT

French 549 **3 units; H(3-0)**

Étude spécialisée de la francophonie
Séminaire sur des sujets avancés ayant trait à la langue, aux littératures ou aux diverses cultures de la francophonie. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

MAY BE REPEATED FOR CREDIT

French 565 **3 units; H(3-0)**

Étude spécialisée de littérature française
Séminaire sur des sujets avancés ayant trait à la littérature française. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

MAY BE REPEATED FOR CREDIT

French 579 **3 units; H(3-0)**

Étude spécialisée de linguistique française
Séminaire sur des sujets avancés dans le domaine de la linguistique française. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

Antirequisite(s): Anti-prérequis: Les étudiants qui ont pris le cours French 479 ne peuvent s'inscrire en French 579.

MAY BE REPEATED FOR CREDIT

French 598 **6 units; F(0-3T)**

Mémoire de baccalauréat spécialisé
Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400, et autorisation du Département.

Note: Remarque: Ce cours est obligatoire pour les étudiants inscrits au programme du baccalauréat spécialisé ("Honours") de français. Le mémoire est rédigé en français.

French 599 **3 units; H(3-0)**

Études spécialisées de la langue, de la littérature ou de la culture
Séminaire sur des questions d'actualité ayant trait à la langue, à la littérature ou à la culture au sens large. Exemples de sujets traités: l'histoire des idées, la littérature française du Moyen-Âge, l'autobiographie, l'écriture des femmes de langue française, le créole dans les écrits de langue française, etc. Le format et le contenu peuvent varier d'une année à l'autre.

Prerequisite(s): Prérequis: Neuf unités (trois demi-cours) de français de niveau 400.

MAY BE REPEATED FOR CREDIT

Graduate Courses

(Dans des cas considérés comme exceptionnels, le Département accordera des crédits au niveau supérieur pour des cours de niveau 500. L'autorisation du Département sera alors indispensable. Les étudiants qui suivront un cours de niveau 500 dans le but d'obtenir des crédits comptant pour leurs études supérieures seront tenus d'effectuer des travaux supplémentaires.)

(The Department will give graduate credit for 500-level courses in cases it deems exceptional. This option is subject to the approval of the Department. Graduate students taking a 500-level course for graduate credit will be asked to complete additional requirements.)

French 605 **3 units; H(3-0)**

Problématiques littéraires
MAY BE REPEATED FOR CREDIT

French 609 **3 units; H(3-0)**

Problématiques linguistiques
MAY BE REPEATED FOR CREDIT

French 625 **3 units; H(3-2)**

Études cinématographiques
MAY BE REPEATED FOR CREDIT

French 635 **3 units; H(3-0)**

Le texte narratif
MAY BE REPEATED FOR CREDIT

French 637 **3 units; H(3-0)**

Études théâtrales
MAY BE REPEATED FOR CREDIT

French 639 **3 units; H(3-0)**

Poésie de langue française
MAY BE REPEATED FOR CREDIT

French 655 **3 units; H(3-0)**

Francophonies
MAY BE REPEATED FOR CREDIT

French 675 **3 units; H(3-0)**

Féminismes et Gender
MAY BE REPEATED FOR CREDIT

French 685 **3 units; H(3-0)**

Voix québécoises et canadiennes
MAY BE REPEATED FOR CREDIT

French 689 **3 units; H(3-0)**

Arts et Cultures
MAY BE REPEATED FOR CREDIT

French 691 **3 units; H(3-0)**

Autour d'un auteur
MAY BE REPEATED FOR CREDIT

French 695 **3 units; H(3-0)**

Profession et recherche
MAY BE REPEATED FOR CREDIT

Geography GEOG

Instruction offered by members of the Department of Geography in the Faculty of Arts.

All students interested in taking Geography courses, Geography Majors and Graduate Students, should read the pertinent Undergraduate and Graduate program sections of the Calendar.

Junior Courses

Geography 205 **3 units; H(3-0)**

Gateway to Geography
An overview of human and physical environments, their inter-relationships and their relevance to environmental issues and world affairs. Major topics are drawn from current global issues where location matters. Specific examples are discussed in a global context and vary by term.

Antirequisite(s): Credit for Geography 205 and any of 201, 203, 211, 251 or 253 (Urban Studies 253) will not be allowed.

Geography 211 **3 units; H(3-2)**

The Physical Environment
Introduction to the physical elements of the environment such as weather, climate, hydrology, landforms, soils, vegetation, and the processes producing variations of these elements on the surface of the earth. The social implications of environmental change, disasters, and hazards are emphasized.

Prerequisite(s): Pure Mathematics 30 or Mathematics 30-1 or equivalent or Mathematics II (offered by Continuing Education).

Note: This course is intended as a foundation for advanced courses in Geography. Student looking for a general interest Geography course are advised to enrol in Geography 205 or 213.

Geography 213 **3 units; H(3-0)**

Geography of World Affairs
Focuses on the major culture regions of the world and also individual countries. Emphasis on the characteristics, distribution, inter-relationships and comparisons of the major culture and physical phenomena of these areas, i.e. population, political situation, economy, language, religion and environment. Some historical developments in each of the areas are presented for perspective, but the major emphasis is on the background for understanding contemporary world affairs.

Geography 231 **3 units; H(3-3)**

Introduction to Geospatial Methods
An introduction to cartography, remote sensing, geographic information systems, and descriptive spatial statistics.

Prerequisite(s): Pure Mathematics 30 or Mathematics 30-1 or equivalent or Mathematics II (offered by Continuing Education).

Note: This course is intended as a foundation for advanced courses in Geography. Student looking for a general interest Geography course are advised to enrol in Geography 205 or 213.

Geography 251 **3 units; H(3-2)**

The Human Environment
The study of people, their origins, culture, technology, economy and impact on the environment. The manner in which people attempt to impose order upon the surface of the earth. Concepts of relative location are introduced with particular regard to both the external orientation and the internal organization of urban areas.

Note: This course is intended as a foundation for advanced courses in Geography. Student looking for a general interest Geography course are advised to enrol in Geography 205 or 213.

Geography 253 **3 units; H(3-0)**
(Urban Studies 253)

Introduction to Cities
A broad introductory survey, from diverse perspectives, of the processes that shape cities and urban life.

Senior Courses

Geography 305 **3 units; H(3-2)**

Weather and Climate
Physical principles of meteorology and climatology. Weather development in relation to different scales of atmospheric circulation. Elements of synoptic and dynamic climatology as determinants of characteristics and the distribution of climates. Laboratory work emphasizes North American examples.

Prerequisite(s): Geography 211.

Geography 307 **3 units; H(3-2)**

Landform Processes and Morphology
A systematic study of the physical processes that shape the Earth's surface.

Prerequisite(s): Geography 211.

Antirequisite(s): Credit for Geography 307 and Geology 373 will not be allowed.

Geography 311 **3 units; H(3-0)**

Natural Events and Human Disasters
Explores how various Earth processes create hazards for humans in different regions. Topics include but are not limited to: earthquakes, volcanic eruptions, tsunami, floods, landslides, hurricanes, drought, famine and disease. Lectures will focus on: (1) the causes of dangerous natural events, (2) how the physical geography of a region affects its vulnerability, (3) historic human impacts, and (4) how people in different regions perceive and mitigate risk from these events.

Antirequisite(s): Credit for Geography 311 and 397.07 will not be allowed.

Geography 313 **3 units; H(3-2)**

Soils and Vegetation
Soil: physical, chemical and biological properties, and the environmental and spatial relationships of vegetation patterns.

Prerequisite(s): Geography 211.

Geography 315 **3 units; H(3-0)**

Global Water Resources
Distributions of fresh water in space and time at regional and global scales. Emphasis on inter-relationships of water, humans and natural ecosystems and impacts on water quality and quantity. Introductory-level exploration of 21st century challenges linked to the development of fresh water resources in the global environment.

Geography 317 **3 units; H(3-0)**

Animal Geography
Explores the socio-spatial relationships between humans and animals, with the goal of elucidating the ecological, economic, political, social, and cultural pressures shaping these relations, and the conflicts arising from human-animal interactions.

Geography 321 **3 units; H(3-0)**

Geography and Our Environment
Environmental and resource issues, with emphasis on topics such as sustainability, ethics; planning; policy and decision making; and management strategies. Case examples highlight issues in resource sectors such as freshwater, oceans, parks and wildlife, tourism and recreation, forests and energy.

Geography 333 **3 units; H(3-3)**

Remote Sensing and Raster GIS
Basic instruction in the use and interpretation of remote sensing imagery. Basic principles of raster display, computation and analysis. Identification, interpretation and mapping of both physical and cultural landscape features.

Prerequisite(s): Geography 231.

Geography 339 **3 units; H(3-2)**

Analytical Methods in Geography I
Introduction to quantitative research methodology, sampling and survey design in geography. Covers the background analytical techniques for an understanding of geographic literature. Examples will involve the use of statistical computer packages.

Prerequisite(s): Geography 231.

Geography 340 **3 units; H(3-0)**

Qualitative Methods in Human-Environmental Research
Introduction to qualitative research methods and research design in human geography and environmental geography.

Prerequisite(s): One of Geography 205, 251, 253; Urban Studies 253.

Geography 341 **3 units; H(3-0)**

Introduction to Economic Geography
Theories, concepts and techniques of economic geography with emphasis on policy issues relating to Canadian examples at the urban, regional, and national levels.

Prerequisite(s): One of Geography 251, 253, Urban Studies 253.

Geography 351 **3 units; H(3-0)**

Urban Social Geography
Concepts of urban geography with particular reference to intra-urban social issues.

Prerequisite(s): One of Geography 251, 253, Urban Studies 253.

Geography 357 **3 units; H(3-3)**

Concepts of GIS
The technical and theoretical foundations of Geographic Information Systems (GIS). Explorations of data types and structures, metadata, data input and manipulation, analytical basics, and visualization techniques will be carried out in lecture and laboratory. Emphasis on vector-based GIS analysis.

Prerequisite(s): Geography 231 or both 333 and 339.

Antirequisite(s): Credit for Geography 357 and 447 will not be allowed.

Geography 361 **3 units; H(3-2)**

Cultural Geographies
Examination of how cultural processes (ways of doing, thinking, representing, creating, relating) inform environment – society interactions.

Prerequisite(s): One of Geography 251, 253, Urban Studies 253.

Geography 365 **3 units; H(3-0)**

Political Geography
Spatial study of political systems, structures and processes, and their relationship to geographic factors.

Prerequisite(s): One of Geography 251, 253, Urban Studies 253.

Geography 367 **3 units; H(3-2)**

Population Geography
Spatial distribution of population, including density composition and characteristics; patterns of migration and settlement in selected areas.

Prerequisite(s): One of Geography 251 or 253.

Geography 371 **3 units; H(3-0)**

Latin America
A survey of the physical, cultural and historical geography of Latin America.

Prerequisite(s): Any course in Geography.

Geography 377 **3 units; H(3-0)**

Sub-Saharan Africa
Dimensions and underlying causes of issues facing African peoples: the colonial legacy, fragile environment, cultural and political diversity, population growth, resource development, urbanization, and economic challenges.

Prerequisite(s): Any course in Geography.

Geography 381 **3 units; H(3-0)**

Canada
The regional geography of Canada. The physical framework of Canada and its significance in Canada's historical development. The concept of the geographic region, the patterns and characteristics of these regions, with selected detailed studies.

Prerequisite(s): Any course in Geography.

Geography 391 **3 units; H(80 hours)**

Geographic Field Studies
An introduction to field research techniques and topics in physical and human geography. Lectures and projects will provide an introduction to a range

of geographic disciplines. Field exercises will normally be conducted away from Calgary for about ten days before Fall Term.

Prerequisite(s): One of Geography 211, 251, 253, Geology 201, 209 and consent of the Department.

Note: Enrolment in Geography 391 may be limited. Preference for registration is given to Majors in Geography, Earth Science and Environmental Science.

Geography 392 **3 units; H(3-7)**

Overseas Field Studies in Physical and Environmental Geography - Part I

Field research and reconnaissance survey of techniques applied to regions outside North America. Group travel-study combined with formal instruction and seminars.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 393 **3 units; H(3-7)**

Overseas Field Studies in Physical and Environmental Geography - Part II

Field research and reconnaissance survey techniques applied to regions outside North America. Group travel-study combined with formal instruction and seminars.

Corequisite(s): Geography 392.

MAY BE REPEATED FOR CREDIT

Geography 394 **3 units; H(3-7)**

Overseas Field Studies in Social and Economic Geography - Part I

Field research and reconnaissance survey techniques applied to regions outside North America. Group travel-study combined with formal instruction and seminars.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 395 **3 units; H(3-7)**

Overseas Field Studies in Social and Economic Geography - Part II

Field research and reconnaissance survey techniques applied to regions outside North America. Group travel-study combined with formal instruction and seminars.

Prerequisite(s): Geography 394.

MAY BE REPEATED FOR CREDIT

Geography 397 **3 units; H(3-0)**

Regional Geography of Selected World Areas

Selected regional geographies. A survey of the physical, cultural and historical geography of a world region.

397.01. The United States of America

397.02. Former Soviet Union

397.03. Australia, New Zealand, Oceania

397.04. Europe

397.05. The Arctic

397.06. Southeast Asia

Antirequisite(s): Credit for Geography 397.01 and 379 will not be allowed; 397.02 and 387 will not be allowed; 397.03 and 389 will not be allowed.

Note: A previous course in geography is strongly recommended as preparation for this course.

Geography 403 **3 units; H(2-2)**

Oceanography

Oceanic circulation, marine biogeochemistry and atmosphere-ocean interactions as controls of climate. Focus on the role of the marine cryosphere at regional, hemispheric and global scales. Interaction of the oceans with landforms, the hydrologic cycle, climate, and people. Laboratory activities to develop field research and analytical skills applicable to all fields of physical geography.

Prerequisite(s): Geography 305.

Geography 407 **3 units; H(3-0)**

Wind Science

Physical laws governing wind processes in the upper atmosphere and the planetary boundary layer. Topics include: global wind patterns, boundary layer wind flow, pollution, wind energy, wind erosion, and wind storms.

Prerequisite(s): Geography 305.

Note: May not be offered every year. Consult the department for more information.

Geography 411 **3 units; H(3-3)**

Fluvial Geomorphology

Contemporary theory in fluvial geomorphology. Topics include channel flow, sediment transport, stream morphology, channel pattern, channel networks, sedimentation and channel response to human and natural environmental change.

Prerequisite(s): Geography 307.

Note: May not be offered every year. Consult the department for more information.

Geography 413 **3 units; H(3-2)**
(Archaeology 413)

Soil Characteristics and Formation

Characteristics of soils and the processes and factors of soil formation. Soil development related to geomorphic materials, geomorphic events, anthropogenic sources, and erosional and depositional landscapes.

Prerequisite(s): Geography 313.

Geography 415 **3 units; H(3-2)**

Hydrology

The physical basis of water utilization and management. Elements of the hydrologic cycle - precipitation, ground water and stream flow. Techniques for estimating water yield and renewal potential in drainage basins.

Prerequisite(s): Geography 305 or 307, and 339; or a course in Statistics by consent of the Department.

Geography 417 **3 units; H(3-3)**

Biogeography and Natural Ecosystems

A multidisciplinary area of contemporary science that examines the distribution (past and present) of animals and plants, on land, in the sea, or in air and the inherent causes of variation in species types, abundance, and survival across the globe. The discipline forms a critical link between the earth sciences (geology and geography) and life sciences (biology).

Prerequisite(s): Geography 313.

Geography 421 **3 units; H(3-0)**

Renewable Resources, Natural Environments and Sustainability

Sustainability approaches and praxis in renewable resources and natural environments; case studies and research projects in topics such as urban natural areas, wilderness parks and reserves, freshwater resources and others.

Prerequisite(s): Geography 321.

Geography 425 **3 units; H(3-0)**

Critical Approaches to Development: Theory and Applications

A critical approach to meanings of economic and social development and the theories of development from a spatial perspective. Other areas of study include: population and health dynamics, gender and development, rural development, industrialization, formal and informal economies, foreign aid, trade and debt, community development. Case studies from Latin America, Asia and Africa.

Prerequisite(s): Geography 351 or 365.

Geography 429 **3 units; H(3-0)**

Tourism, Recreation and Environmental Management

Dimensions of, approaches to, and issues in recreation and environmental management; planning for sustainable tourism; cultural and heritage tourism; adventure and eco-tourism; and other representative tourism and recreational activities and environments. Case studies emphasize assessment and monitoring, policy initiatives and decision-making, and other practical orientations.

Prerequisite(s): One of Geography 321, 327, or 329.

Note: May not be offered every year. Consult the department for more information.

Geography 433 **3 units; H(3-3)**

Remote Sensing

Principles of earth resource analysis using digital images collected from instruments on airborne and spaceborne platforms. The full range of the electromagnetic spectrum currently used in remote sensing. Emphasis will be given to complementing conventional data and methods with automated techniques.

Prerequisite(s): Geography 333 and 339.

Geography 437 **3 units; H(3-3)**

Cartography and Geographic Visualization

The role of cartography and geographic visualization is explored both theoretically and practically in the communication of spatial data. Topics will relate to major issues in advanced map design and spatial data interaction with examples from the urban, cultural and environmental settings. Sample approaches will be critically examined within lectures and laboratories.

Prerequisite(s): Geography 231; and one of Geography 333 or 357.

Geography 439 **3 units; H(3-2)**

Analytical Methods in Geography II

Methods for the analysis of temporal, spatial and multivariate data sets. Emphasis is placed on data sets relating to geographic phenomena, resource utilization and environmental problems, with examples from the geographic literature. Examples will involve the use of computer packages.

Prerequisite(s): Geography 339.

Geography 451 **3 units; H(3-0)**

Urban Systems Development

A critical review of the geographical principles of urban growth and uneven development in the context of local, regional and global urban systems. Topics may include urbanization processes under capitalism, city-regions, global city networks, returns to urban agglomeration, inter-spatial competition, and transnational movements of capital and labour.

Prerequisite(s): Geography 341.

Geography 457 **3 units; H(3-3)**

Urban and Environmental GIS
The role of Geographic Information Systems in environmental research and management is explored both theoretically and practically. Topics will relate to major issues within the urban and environmental fields. Advanced analytical approaches will be critically examined within lecture and laboratories.

Prerequisite(s): Geography 357.

Geography 463 **3 units; H(3-0)**

Cities, Poverty and Development
Analysis of the explosive growth and geographical character of Third World cities. Topics normally include: rural-urban migration, development theory and urbanization, housing, formal/informal labour market, service and food provision, social and political conflict. Case studies from Latin America, Asia and Africa.

Prerequisite(s): Geography 351 or 365.

Geography 465 **3 units; H(3-0)**

Science, Nature, Politics
Examines competing claims about knowledge, authority and expertise that occur in environmental and other science-based controversies. Introduces core concepts and debates surrounding risk, uncertainty, and democratic engagement in technoscientific contexts, with a focus on the shifting role of citizens and, more generally, publics, in geography, environmental decision-making and urban planning. Science, Technology and Society (STS) frameworks will evaluate how avenues for public engagement are understood and constructed in relation to fundamental societal issues.

Prerequisite(s): 60 units (10.0 full-course equivalents).

Geography 470 **3 units; H(3-0)**

Behavioural Geography
An approach to human geography that studies and explains human behaviour in geographic space as a function of normative, descriptive, and prescriptive models of human judgment and decision-making. Course topics will focus on how humans perceive the environment around them in both physical and behavioural terms, and how they use this information when making judgments and choices that lead to behaviour. The course also includes material on environmental decision support.

Prerequisite(s): Geography 251 and 60 units (10.0 full-course equivalents).

Geography 479 **3 units; H(3-0)**
(Anthropology 479)

Housing and Society
Examines interactions between housing and social organization in cross-cultural context. Emphasizes the varied types of built form, their cultural meanings, implications for social life within households and for society more broadly, and their political and economic consequences. Pays particular attention to contemporary housing problems such as homelessness and urban sprawl.

Prerequisite(s): Geography 351 or Anthropology 379.

Geography 503 **3 units; H(3-0)**

Climate Change
Overview of global climate dynamics and the interactions between ocean, atmosphere, biosphere, cryosphere, and biogeochemical cycles. Examination of climate change in Earth's past, present, and future, scrutinizing both natural and anthropogenic influences on the global climate system.

Prerequisite(s): Geography 305.

Geography 507 **3 units; H(3-3)**

Glacial Geomorphic Systems
Contemporary theories for the formation of glacial landforms and sediments are evaluated. Topics include glacial mechanics, erosion, deposition, and hydrology. Timing and dynamics of glaciation and deglaciation are addressed.

Prerequisite(s): Geography 307.

Note: Geography 411 is strongly recommended.

Geography 509 **3 units; H(3-3)**
(formerly Geography 409)

Permafrost
Development, characteristics and significance of permafrost, including the thermal and hydrological processes and resulting periglacial geomorphology and geotechnical implications.

Prerequisite(s): Geography 305 and 307.

Geography 516 **3 units; H(3-3)**
(formerly Geography 515)

Ecohydrology
Linkages between physical, chemical and biological processes influencing hydrology in headwater catchments. Application of process-based knowledge to problems of water quality management and ecosystem reclamation.

Prerequisite(s): Geography 415.

Geography 517 **3 units; H(3-3)**

Conservation GIS
Applies advanced geospatial analysis techniques to predictive modelling with a specific focus on conservation. Wildlife species, habitat selection, and consequences of human alteration of landscapes are the entry point to understanding and evaluating the geospatial approaches used, and the techniques may be extended to any spatial phenomena. Students will learn to apply a variety of statistics (e.g. chi-square, logistic regression) and to critically evaluate their analytical approaches within a context of environmental conservation.

Prerequisite(s): Geography 339, 357 and 417.

Antirequisite(s): Credit for Geography 517 and 619 will not be allowed.

Geography 519 **3 units; H(3-2)**

Landscape Ecology
Concepts and methods for examining the spatial pattern of natural and managed landscapes and their effects on ecological processes. Applications in land management and biological conservation will also be considered.

Prerequisite(s): One of Geography 313 or Biology 313 and one of Geography 339 or Biology 315.

Note: At least one of the following is also strongly recommended: Geography 417, 421, 517, or Ecology 419, 439, 501.

Geography 521 **3 units; H(3-0)**

The Urban Environment
Urban environments and their construction as a reflection of human needs and non-human constituents, systems of production and distribution, urban policy, infrastructure, and design are considered from the perspectives of both physical and human geography. Critical examination of anthropocentric notions of duality, space, place, and 'the other' frame the examination of human management practices and non-human nature. Topics may include the explosion of monocultures and exotic species, heightened human-wildlife conflict, altered hydrological systems, air pollution, changing environments of infectious disease, and toxic waste.

Prerequisite(s): One of Geography 317, 321, 417 and one of Geography 321, 351, 451.

Geography 522 **3 units; H(3-0)**

Topics in Politics of the Environment
Key issues in environmental policy, focusing on the power and interest mechanisms that determine environmental resource access and sustainable use. Case-specific applications explore the dynamic roles of the global and the local including international development paradigms, indigenous resource rights, common-pool resource management, powerful policy networks, and local communities struggling in between.

Prerequisite(s): Geography 321 plus one of 361, 421, 425, 429.

Note: May not be offered every year. Consult the department for more information.

MAY BE REPEATED FOR CREDIT

Geography 529 **3 units; H(3-0)**

Research and Planning for Tourism and Recreation Resources
Research and techniques in analysis, planning and management of touristic and recreational resources. Usually involves a major case study/field research project.

Prerequisite(s): Geography 421 or 429 and consent of the Department.

Note: May not be offered every year. Consult the department for more information.

MAY BE REPEATED FOR CREDIT

Geography 531 **3 units; H(2-3)**

Remote Sensing and Natural Resource Management
Advanced digital image analysis used in natural resource management studies including mapping, monitoring and modelling.

Prerequisite(s): Consent of the Department.

Note: May involve field work.

Geography 533 **3 units; H(2-3)**

Topics in Geospatial Analysis
Advanced topics of current interest in one or more of remote sensing, geographic information science and spatial statistics. Chosen topics vary by term and focus on integrating raster and vector systems.

Prerequisite(s): Any two of Geography 433, 439, 457, 547 and consent of the Department.

Note: Students should consult the Department before registering to learn what topics will be covered in a given year.

MAY BE REPEATED FOR CREDIT

Geography 537 **3 units; H(2-3)**

GIS and Natural Resource Management
Techniques of natural resource analysis and modelling using multiple digital data types within a GIS framework; fundamental operations, issues and applications.

Prerequisite(s): Consent of the Department.

Note: May involve field work.

Geography 553 **3 units; H(3-0)**

Globalization and the City
Introduction to the social, cultural, political and economic forces operating on a global scale that increasingly shape the dynamics of cities. Emphasis is placed on social and cultural hybridity,

translocal interaction, geographies of social and economic polarization, and the scalar politics and regulation of globalization.

Prerequisite(s): One of Anthropology 379, 387, Economics 365, Geography 341, 351, or Sociology 353.

Geography 555 **3 units; H(3-0)**

Rapid Urbanization in a Megacity
This intensive one-week course addresses the challenges of urban planning and development in one of the largest mega-cities in the Western hemisphere. The course tests students' theoretical knowledge of concepts of urban planning as they come into direct contact with the challenges faced by rapid urbanization in situ.

Prerequisite(s): Consent of the Department.

Note: Admission is limited and competitive. Consent is usually given to students with a strong background in Latin American Studies and/or Urban Geography.

Geography 561 **3 units; H(3-0)**

Critical Debates in Cultural Geography
In-depth discussion of key topical issues and points of debate in the field, including methodological issues, points of theoretical conflict among the subfields of Geography, moral or ethical issues in Geography.

Prerequisite(s): Geography 361.

Note: May not be offered every year. Consult the department for more information.

Geography 565 **3 units; H(3-0)**

Urban Political Geography
An examination of how urban spatial relations shape, and are shaped by, political institutions, organizations, and social movements. Themes may include the politics of urban growth, urban environmental justice, urban sustainability, place-based politics, and multi-scalar politics.

Prerequisite(s): Geography 351 or 451.

Geography 567 **3 units; H(3-3)**

Introduction to Programming in Geographic Information Systems
Introduction to computer programming for customizing and automating a GIS. Topics include object-oriented programming techniques, advanced geoprocessing, scripting, and automation using a programming language such as Python or Visual Basic.

Prerequisite(s): Geography 357.

Note: Geography 457 is recommended.

Geography 591 **3 units; H(3-7)**
(formerly Geography 590)

Overseas Field Studies in Physical and Environmental Geography
Field research and reconnaissance survey techniques applied to regions outside North America. Individual and group travel-study combined with formal instruction and seminars.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 593 **3 units; H(3-7)**
(formerly Geography 592)

Overseas Field Studies in Social and Economic Geography
Field research and data collection techniques applied to geographical phenomena in regions outside North America. Periods of individual and group travel-study are interspersed with formal instruction and seminars.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 597 **3 units; H(3-0)**

Selected Topics in Human Geography
Content will vary from year to year. Consult Department for details.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 599 **3 units; H(3-0)**

Selected Topics in Physical Geography
Content will vary from year to year. Consult Department for details.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Geography 601 **3 units; H(0-1.5S)**

Graduate Research Seminar
Presentation and evaluation of graduate research seminars.

Prerequisite(s): Consent of the Department.

Note: Normally offered over both fall and winter terms. Normally open to Geography thesis-based graduate students only.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Geography 603 **3 units; H(3-3)**

Remote Sensing: Basics and Beyond
Introduction to the theory and practice of remote sensing. Topics include physics of remote sensing, sensor systems, resolutions, geometric and radiometric correction, image analysis (enhancements, filtering, texture analysis, principal components, classification approaches and algorithms and accuracy). May include specific image acquisition systems and their methodological requirements. Emphasis is on fundamental concepts. Laboratory provides experience with fundamental image processing techniques.

Prerequisite(s): Consent of the Department.

Geography 605 **3 units; H(3-3)**

Statistical Analysis: Basics and Beyond
Introduction to applied statistics, particularly as they are used in geographical analysis. Topics include sampling design, summary statistics, probability theory, inferential statistics, and multivariate analysis. Laboratory exercises give students hands-on experience in computer-based statistical analysis.

Prerequisite(s): Consent of the Department.

Geography 607 **3 units; H(3-3)**

Geographic Information Systems: Basics and Beyond
Introduction to the world of Geographic Information Systems (GIS). Includes: representing reality in the digital realm, georeferencing, data structures, software history and comparison, and the full spectrum of analytical approaches associated with advanced GIS software. A major part of the work will be hands on. Software is used as a vehicle for taking the theory and concepts into a working reality.

Prerequisite(s): Consent of the Department.

Geography 621 **3 units; H(2-2)**

The Politics of Environment
Contemporary issues in environmental conflict, management and governance with case-specific applications from global to local.

Prerequisite(s): Consent of the Department.

Note: May not be offered every year. Consult the department for more information.

Geography 633 **3 units; H(3-3)**

Research and Applications in Remote Sensing
Review and basic and advanced principles of image analysis. Includes advanced laboratory techniques, integration of remote sensing with GIS, current research in remote sensing, project organization, and data sources for remote sensing.

Prerequisite(s): Consent of the Department.

Geography 635 **3 units; H(3-3)**

Active Microwave Remote Sensing
Theoretical and applied aspects of active microwave remote sensing for geophysical parameter estimation. Discussion of sensor configuration, dielectric mixture modelling, microwave-surface interactions, microwave scattering (surface and volume) modelling and polarimetry. Laboratory work includes field scatterometer use, computer modelling, and polarimetric analysis.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Geography 635 and 699.35 will not be allowed.

Geography 639 **3 units; H(3-3)**

Advanced Spatial Analysis and Modelling
History of spatial modelling in geography; comprehensive coverages of techniques, spatial analysis and spatial modelling as currently used within GIS and remote sensing.

Prerequisite(s): Consent of the Department.

Geography 647 **3 units; H(3-3)**

Advanced Research and Applications in Geographic Information Systems
Focus on advanced GIS applications in core areas; methodological developments in GIS, and current research directions in GIS.

Prerequisite(s): Consent of the Department.

Geography 681 **3 units; H(3-0)**

Geographic Information Systems Project: Theoretical Issues
A critical and comprehensive review of information and literature on a GIS research topic This course provides the conceptual basis for Geography 683.

Prerequisite(s): Geography 633, 639 and 647 and consent of the Department.

Geography 683 **3 units; H(3-0)**

Geographic Information Systems Project: Application
Implementation of a project on a GIS topic which will involve demonstrating mastery of GIS project design and the implementation and presentation of results commensurate with graduate level work. This topic will relate to material covered by the student in Geography 681.

Prerequisite(s): Geography 681 and consent of the Department.

Geography 685 **3 units; H(3-0)**

Arctic System Science
This course investigates the process linkages at various spatiotemporal scales between the atmosphere, lithosphere and hydrosphere operating

within high latitude environments of the Northern Hemisphere. Of particular interest is the response of the terrestrial and marine cryosphere to climate variability and change, including methods for its detection and quantification.

Prerequisite(s): Consent of the Department.

Geography 687 **3 units; H(3-3)**

Advanced Glacial Geomorphic Systems
Contemporary topics in glacial geomorphology and sedimentology. Course consists of lecture, seminar and field trip components.

Prerequisite(s): Consent of the Department.

Geography 689 **3 units; H(3-3)**

Advanced Topics in Geocryology
Contemporary topics in the science and engineering of seasonally and perennially frozen ground. Course consists of lectures and seminars.

Prerequisite(s): Consent of the Department.

Geography 691 **3 units; H(3-3)**

Advanced Fluvial Geomorphology
Advanced theory and research issues in fluvial geomorphology. Topics may include flow hydraulics, sediment transport, river morphology, channel networks, sediment routing, drainage basin evolution, and channel response to environmental change.

Prerequisite(s): Consent of the Department.

Note: May not be offered every year. Consult the department for more information.

Geography 695 **3 units; H(3-0)**

Seminar in Geographic Research Methods
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 696 **3 units; H(3-0)**

Urban, Regional and Global Political Economy Seminar
Spatial and power relations that shape urban, regional and global processes. Investigation of a wide range of processes, ranging in scale from the local to the global: capital investment and disinvestment; state power and policymaking; planning, governance and governmentality; political struggle, all in multiple forms of spatiality: place, scale, territory, networks.

Prerequisite(s): Consent of the Department.

Note: Intended for students enrolled in a Geography graduate degree program or a graduate degree program of a cognate discipline.

Geography 697 **3 units; H(3-0)**

Seminar in the Philosophy and Nature of Human Geography
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 699 **3 units; H(3-0)**

Seminar in the Philosophy and Nature of Physical Geography
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

A list of specific subtitles for the 700-level courses listed below is available in the Department.

Geography 795 **3 units; H(3-0)**

Selected Topics in Geographic Research Methods
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 797 **3 units; H(3-0)**

Selected Topics in Human Geography
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 799 **3 units; H(3-0)**

Selected Topics in Physical Geography
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geology GLGY

Instruction offered by members of the Department of Geoscience in the Faculty of Science.

Students interested in taking geology courses are urged to read the advice in the Faculty of Science Program section of this Calendar.

Junior Courses

Geology 201 **3 units; H(3-3)**

Principles of Geoscience
Composition and internal structure of the Earth; surface processes; internal processes and global tectonics; rocks and minerals, topographic and geologic maps.

Antirequisite(s): Credit for Geology 201 and 209 will not be allowed.

Geology 202 **3 units; H(3-3)**

Applications of Geoscience
Applications of geology and geophysics to the study of earthquakes, volcanoes and other geologic hazards; natural resources; environmental management; human impact on the Earth and global change.

Prerequisite(s): Geology 201.

Antirequisite(s): Credit for Geology 202 and 203 will not be allowed.

Geology 209 **3 units; H(3-0)**

Introduction to Geology
Basic concepts regarding the major features of Earth; its rock and mineral composition, processes controlling erosion, deposition and surface structures; formation of mountains, ocean basins and continents; internal structure of the Earth and plate tectonics.

Antirequisite(s): Credit for Geology 209 and 201 will not be allowed.

Note: Not open for credit to Honours, Majors or Minors in Geology, Geology (Petroleum Geology Concentration), Applied and Environmental Geology, Geophysics, Environmental Science (Geology Concentration) or Natural Sciences (Geoscience Concentration).

Senior Courses

Geology 301 **3 units; H(3-0)**

Geology of the Mountain Regions of Western Canada
Selected topics encountered in introductory physical geology will be pursued in greater depth in order to explain the geology of Western Canadian Mountain Parks and adjacent areas.

Prerequisite(s): Geology 201 or 209.

Geology 305 **3 units; H(2-1T)**

Introduction to Dinosaurs
Biology, evolution, and extinction of dinosaurs; geographic and temporal distribution, habitats, and ecology of the various dinosaur groups; preservation, exploration, collection, preparation, and identification of dinosaur fossils.

Geology 307 **3 units; H(3-0)**

Geological History of Life
The history of life from the earliest records to the present. Fossils, geological time, extinction, basic paleontology. The rise and development of various animals and plants including dinosaurs, mammals and humans.

Geology 313 **3 units; H(3-3)**

Mineralogy
The chemical and physical properties of the common minerals in the context of the common rock types; introduction to crystallography; optical properties of minerals; introduction to mineral associations and rock textures in hand samples and thin sections; introduction to analytical techniques (XRD, electron microprobe, etc.).

Prerequisite(s): Geology 201; Geology 202 or 203; Chemistry 201 or 211; Mathematics 249 or 251 or 265 or 275 or Applied Mathematics 217; Physics 211 or 221.

Antirequisite(s): Credit for Geology 313 and 423 will not be allowed.

Geology 323 **3 units; H(3-3)**

Geochemical Processes
Focus is on chemical processes taking place in geological settings with emphasis on the abundance relationships of the elements in the Earth and the processes governing the differentiation, migration and distribution of the elements. Discussions include mineral, rock and aqueous chemistry; applications of radiogenic and stable isotopes; thermodynamics and phase diagrams; biogeochemistry and organic geochemistry; analytical techniques; applications and case studies.

Prerequisite(s): Geology 313; Chemistry 201 or 211; Chemistry 203 or 213.

Geology 333 **3 units; H(3-3)**

Igneous, Metamorphic and Ore Rocks and Processes
Origin, identification, classification and interpretation of igneous and metamorphic rocks. Including common rock types, mineral assemblages and textures in hand samples and thin section, volcanic and plutonic processes and conditions, thermo-chemical conditions of metamorphic rock formation, introduction to ore deposits and ore minerals in hand sample, Canadian examples of ore deposits, tectonic settings of igneous, metamorphic and ore rocks.

Prerequisite(s): Geology 313; Chemistry 201 or 211; Chemistry 203 or 213.

Antirequisite(s): Credit for Geology 333 and 311 will not be allowed.

Geology 337 **3 units; H(160 hours)**

Introduction to Geologic Field Methods
Study of various rock types and sediment exposures focusing on recognition and description of rock types, construction of geological maps and cross-sections and measurement of stratigraphic sections. Field skills will include map interpretation, navigation, and measuring planar and linear features. Field exercises will normally be conducted

off campus for about 15-18 days during August before the Fall Term of third year.

Prerequisite(s): Geology 333 or 311; and Geology 343 or 341; and Geology 381 and admission to programs in Geology or Geophysics or Applied and Environmental Geology or Environmental Science (Geology concentration) or Natural Sciences (Geoscience concentration) and consent of the Department.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geology 343 **3 units; H(3-3)**

3D Geologic Structures and Methods
Methods of 3D geologic data collection, manipulation and interpretation. Special emphasis on maps and cross sections and the geometric methods and data types used to understand and work with 3D geologic relationships. Course will emphasize hands-on exercises and teach the application of: geologic maps, subsurface data; relative dating; cross-cutting relations, and 3D visualization of the architecture of geological bodies and surfaces and their relationship to causative processes.

Prerequisite(s): Geology 381.

Antirequisite(s): Credit for Geology 343 and 341 will not be allowed.

Geology 353 **3 units; H(3-3)**

Surficial Systems
Overview of the geomorphologic and hydrologic processes that operate on and just beneath the Earth's surface. Includes hydrology (precipitation, evaporation, soil water, ground water, and their interaction in watersheds), surface processes (erosion, weathering, rivers, glaciers, Quaternary geology, landforms); engineering properties of surface materials; applications (including aggregates and water as resources, geotechnical issues, water quality, etc.).

Prerequisite(s): Geology 201; and 202 or 203; Chemistry 203 or 213; Physics 211 or 221, and 223; Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219.

Antirequisite(s): Credit for Geology 353 and 373 will not be allowed.

Geology 377 **3 units; H(3-3)**

Petroleum Engineering Geology
The principles and methods of physical geology with special emphasis on their application to the exploitation of oil and gas. Laboratory: properties of minerals and rocks, analysis and interpretation of surface and subsurface maps, interpretation of borehole logs and core, properties of sedimentary rocks.

Antirequisite(s): Credit for Geology 377 and 201 will not be allowed.

Note: This course is restricted to engineering students.

Geology 381 **3 units; H(3-3)**

Sedimentary Rocks and Processes
Origin, identification, classification and interpretation of sediments, siliciclastic, carbonate and evaporite rocks. Study of sediment/rock components (minerals), fossils and textures in hand sample and thin section; sedimentary structures and processes; introduction to depositional environments; burial, lithification and diagenesis; applications, including introduction to basin analysis/tectonics, exploration for water and petroleum resources, etc.

Prerequisite(s): Geology 201, and 202 or 203; Chemistry 201 or 211 or 203 or 213; Physics 211 or 221.

Geology 401 **3 units; H(3-2)**

Physical Hydrogeology
Hydrologic cycle, conservation principle, Darcy's Law, groundwater flow systems, aquifer testing, soil hydrology, effective stress, land subsidence, solute transport.

Prerequisite(s): Geology 353.

Antirequisite(s): Credit for Geology 401 and 601 will not be allowed.

Geology 403 **3 units; H(3-3)**

Aqueous Geochemistry
Theoretical and applied aspects of aqueous solution chemistry. Topics include: methods for collection and preservation of water samples in the field, laboratory analysis of waters, theory and application of aqueous thermochemical models.

Prerequisite(s): Geology 323.

Antirequisite(s): Credit for Geology 403 and 503 will not be allowed.

Geology 431 **3 units; H(3-3)**

Igneous Petrology
Petrogenesis of igneous rocks using field data, geochemistry and experiments. Application of igneous petrology to Earth processes and evolution.

Prerequisite(s): Geology 323 and Geology 333 or 311.

Antirequisite(s): Credit for Geology 431 and either 443 or 531 will not be allowed.

Geology 433 **3 units; H(3-3)**

Metamorphic Petrology
Petrogenesis of metamorphic rocks using field data, geochemistry and experiments. Application of metamorphic petrology to Earth processes and evolution.

Prerequisite(s): Geology 323 and 333 or 311.

Antirequisite(s): Credit for Geology 433 and either 443 or 533 will not be allowed.

Geology 435 **3 units; H(160 hours)**

Field Methods
Field study of geometrically complex geological problems. Involves independent mapping and report writing. Field exercises will normally be conducted away from Calgary for about 10-12 days preceding the Fall Term or following the Winter Term.

Prerequisite(s): Geology 323, 337 and 381; one of Geology 311 or 333; one of Geology 341 or 343 and admission to the Geology or Applied and Environmental Geology programs and consent of the Department.

Antirequisite(s): Credit for Geology 435 and either Geology 437 or 439 will not be allowed.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. It may occur outside Canada. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geology 441 **3 units; H(1T-160 hours)**

Field Techniques in Hydrogeology
Entails a week at a hydrogeology field site in Alberta or British Columbia. Hydrogeology and geotechnical techniques will be demonstrated and will involve hands-on participation by students. After the field work, students will conduct extensive analysis and interpretation of data gathered during the field session, complete exercises and prepare a written report. The course normally runs for two to three weeks following Winter Term Final Examinations or prior to the Fall Term.

Prerequisite(s): Geology 401 and consent of the Department.

Antirequisite(s): Credit for Geology 441 and 639 will not be allowed.

Note: This course has limited enrolment. This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geology 445 **3 units; H(3-3)**

Structural Geology
Mechanical principles involved in the deformation of rocks; classification of tectonic structures in stratified and non-stratified rocks; manipulation of structural data and its predictive use. Includes basic kinematics, dynamics, rheology, and descriptive structural geology. Also includes a strong lab component emphasizing 3D problem solving, structural analysis, and the use of geologic data sets to construct geologic cross-sections.

Prerequisite(s): Geology 343; Mathematics 253 or 283 or 267 or 277 or Applied Mathematics 219; Mathematics 211.

Antirequisite(s): Credit for Geology 445 and 341 will not be allowed.

Geology 463 **3 units; H(3-3)**

Siliciclastic Sedimentology
Depositional and diagenetic facies models applied to main depositional settings for siliciclastic sedimentary rocks, based on both modern and ancient examples. Investigation of the linkages between provenance, deposition, stratigraphic stacking and diagenesis of siliciclastic rocks, and how these factors affect the quality of subsurface fluid reservoirs.

Prerequisite(s): Geology 323 and 381 and one of 341 or 343.

Antirequisite(s): Credit for Geology 463 and 461 will not be allowed.

Geology 471 **3 units; H(3-3)**

Geology, Engineering, and the Environment
The principles and methods of physical geology with special emphasis on their application in dealing with civil engineering and environmental problems. Laboratory: properties of minerals and rocks, analysis and interpretation of geological maps, photogeology and seismic refraction in site investigation problems.

Note: This course is restricted to engineering students.

Geology 475 **3 units; H(3-0)**

The Geological Record of Global Change
Geochemical relationships among the atmosphere, hydrosphere, and lithosphere will be examined. Topics include the carbon cycle, chemical weathering, mid-ocean ridge hydrothermal activity, past changes in seawater chemistry, stable isotopes, climate change.

Prerequisite(s): Geology 201, and 202 or 203; Chemistry 201 or 211; Chemistry 203 or 213; Mathematics 249 or 251 or 265 or 275 or 281 or Applied Mathematics 217.

Geology 483 **3 units; H(3-3)**

Carbonate Sedimentology
Petrography of carbonate sediments and their biotic and abiotic constituents. Ocean chemistry of carbonate systems and ocean acidification. Sedimentological, biological and climatic significance of modern and ancient carbonates. Warm- and cool-water carbonate factories. Lacustrine, peritidal, neritic, reef, slope, and pelagic environments. Diagenesis, dolomitization and carbonate reservoirs.

Prerequisite(s): Geology 323, 381, 493 and one of 341 or 343.

Antirequisite(s): Credit for Geology 483 and either 461 or 583 will not be allowed.

Geology 493 **3 units; H(3-3)**

Evolution of Earth Through Life and Time
Origin and evolution of life within the framework of evolution of continents, oceans and atmosphere. Processes and signature of life. Concepts and patterns of evolutionary biology/paleobiology, extinctions, and diversity of life forms. Morphology and taxonomy of fossil groups and geological applications.

Prerequisite(s): Geology 381 and one of 341 or 343.

Antirequisite(s): Credit for Geology 493 and 491 will not be allowed.

Geology 505 **3 units; H(3-3)**

Contaminant Hydrogeology
Chemical and biological processes in surface water and groundwater systems. Topics include: water quality, contaminant transport and dispersal, fluid-sediment interactions, remediation of contamination. Techniques will include the use of thermochemical models, numerical modelling of contaminant migration, and examination of case studies.

Prerequisite(s): Geology 401 or 601 and Geology 403 or 503.

Antirequisite(s): Credit for Geology 505 and 609 will not be allowed.

Geology 510 **6 units; F(0-9)**

Senior Thesis
A written report based on independent study. Originality is emphasized, laboratory and field studies are encouraged. Published material may be included.

Prerequisite(s): Consent of the Department and of a departmental faculty member who will act as a supervisor.

MAY BE REPEATED FOR CREDIT

Geology 523 **3 units; H(3-3)**

Advanced Mineralogy
Crystal chemistry of important mineral groups. Relations between structure, property, and composition. Common structure types and their use in understanding complex minerals. Elements of symmetry, space groups, X-ray diffraction techniques, and introduction to crystal structure determination and refinement using experimental data sets and extensive use of computers. Emphasis is on the interpretation and application of results to solving problems in Earth Sciences.

Prerequisite(s): Geology 313 or 423 and 78 units (13 full-course equivalents).

Geology 527 **3 units; H(3-3)**

Ore Deposits
Processes of formation of metallic ore and diamond ore deposits. Classification of ores based on petrologic association. Introduction to ore microscopy.

Prerequisite(s): Geology 431 and 433; or Geology 443.

Note: A week-end field trip will be run in September.

Geology 535 **3 units; H(3-2S)**

Early Earth Evolution
Geological evolution in the early stages (Precambrian) of Earth's history including planetary accretion, core formation, evolution of mantle and differentiation of bulk silicate earth, evolution of continental crust and its tectonic mechanisms, evolution of continental mantle lithosphere, evolution of atmosphere and hydrosphere, geologic record of early life, etc. Current geochemical and geodynamic models that attest to these events in the geological record will be explored.

Prerequisite(s): Geology 431 and 433; or Geology 443.

Antirequisite(s): Credit for Geology 535 and 599.18 will not be allowed.

Geology 537 **3 units; H(160 hours)**

Advanced Field Methods
Field study of geological problems using advanced methods. Field exercises will normally be conducted away from Calgary for about 10-12 days preceding the Fall Term or following the Winter Term.

Prerequisite(s): Geology 333 or 311; Geology 381; Geology 435; Geology 445 or 341 and consent of the Department.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. It may occur outside Canada. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geology 541 **3 units; H(3-3)**

Advanced Structural Geology
Structural features of complexly folded strata; advanced fold and fault analysis; simple statistical analysis of data; structural analysis; applications to exploration and exploitation; cross-sections and balancing; advanced map interpretation; tectonics; neotectonics.

Prerequisite(s): Geology 445 or 341 and 78 units (13 full-course equivalents).

Antirequisite(s): Credit for Geology 541 and 641 will not be allowed.

Note: There may be a week-end field excursion during the term.

Geology 543 **3 units; H(3-3)**

Advanced Igneous and Metamorphic Petrology
Advanced study of igneous and/or metamorphic petrology, and integration with structure, geochronology and tectonics. Applications to problems in earth science. Includes use of microscopy and geochemistry, as well as possible application of instrumental methods.

Prerequisite(s): Geology 431 and 433; or Geology 443.

Geology 545 **3 units; H(160 hours)**

Petroleum Geology Field School
Description and analysis of sedimentary rocks in the field with the objective of recognizing and developing analog models for basin- and field-scale subsurface fluid reservoirs. Consideration of the range of factors affecting reservoir quality e.g. depositional settings, stratigraphy, diagenesis, deformation, etc. Field School will normally be conducted away from Calgary for about 10-12 days preceding the Fall Term or following the Winter Term.

Prerequisite(s): Geology 435 and consent of the Department.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geology 555 **3 units; H(3-2S)**

Global Tectonics
Global aspects of plate tectonics and regional geology through time. Application of fundamental stratigraphic and structural principles. Contributions of geophysics, geochemistry, experimental and theoretical petrology to the modern plate tectonic model. Analysis and interpretation of major structural provinces as they relate to plate boundary interactions.

Prerequisite(s): Geology 431 or 443, and Geology 493 or 491.

Geology 561 **3 units; H(3-3)**

Sequence Stratigraphy
Integrated approach to the study of genetic stratigraphic sequences and their bounding surfaces, linked to facies analysis of clastic and carbonate successions. Principles of sequence stratigraphy and applications to petroleum reservoirs.

Prerequisite(s): Geology 343 or 341; and Geology 381; and 78 units (13 full-course equivalents).

Geology 571 **3 units; H(3-3)**

Engineering Geology
The role of geology in engineering problems. Characterization of rock, rock masses and soil. Mechanical behavior of geologic material. Investigation methods and case histories.

Prerequisite(s): Geology 353 and 445.

Geology 577 **3 units; H(3-3)**

Introduction to Petroleum Geology
Fundamental concepts of petroleum geology from deposition/maturation of source rocks to hydrocarbon generation, migrate on and accumulation. Principles of hydrocarbon production, introduction to techniques of subsurface geological analysis applied to the evaluation and quantification of oil and gas reservoirs.

Prerequisite(s): Geology 445 or 341, Geology 493 or 491 or 461, Geophysics 351 or 355; or Geophysics 457.

Antirequisite(s): Credit for Geology 577 and any of 575, 589.01, 589.02, 589.07, 589.08, 591, 595.01, 596, 689.01, 689.02, 689.07, 689.08, 694.01, 694.03, 696, will not be allowed.

Geology 579 **3 units; H(3-3)**

Basin Analysis
Origin of basin subsidence, basin fills and petroleum systems. Basins in their geodynamic environment. Physical state of the lithosphere. Basins due to lithospheric stretching, flexure, and strike-slip deformation. Effects of mantle dynamics. Sediment provenance and routing system. Basin stratigraphy. Subsidence and thermal history. Petroleum basins from around the world.

Prerequisite(s): Geology 445 or 341; 463 or 461; 493 or 491; 577; Geophysics 351 or 355.

Antirequisite(s): Credit for Geology 579 and 595.05 will not be allowed.

Geology 581 **3 units; H(3-3)**

Advanced Petroleum Geology
Principles and applications of the characterization of petroleum systems, reservoirs and their fluids with a focus on unconventional resources. Methods of reservoir characterization, log analysis, subsurface mapping and the evaluation of reservoir heterogeneity with respect to geological characteristics and fundamental fluid flow related reservoir and fluid properties. Also examines subsurface CO2 storage and other routes to eliminating CO2 emissions from fossil fuel use as well as looking at the role of geoscience in energy recovery innovation and technology development.

Prerequisite(s): Geology 577.

Antirequisite(s): Credit for Geology 581 and any of 575, 589.01, 589.02, 589.07, 589.08, 591, 595.01, 596, 689.01, 689.02, 689.07, 689.08, 694.01, 694.03, 696 will not be allowed.

Geology 587 **3 units; H(3-3)**

Invertebrate Paleobiology
Advanced study of selected groups of invertebrate fossil groups, micro- and macrofossils, with extensive presentation of various aspects related to morphology, fossilization, taxonomy, classification, biostratigraphical distribution, evolution, extinction, and industry applications. The lab component includes direct study on each of the fossil groups and advanced biostratigraphy exercises.

Prerequisite(s): Geology 493 or 491; or Geology 202 or 203 and Zoology 375.

Geology 597 **3 units; H(3-3)**

Geostatistics
Statistical analysis of spatial data, multivariate data analysis, regression, variogram analysis, kriging, co-kriging and stochastic simulation.

Prerequisite(s): Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219 and Mathematics 211 and 78 units (13 full-course equivalents).

Antirequisite(s): Credit for Geology 597 and 697 will not be allowed.

Geology 599 **3 units; H(3-3)**

Contemporary Topics in Geology
Courses are offered in contemporary topics in areas such as geochemistry, hydrogeology, mineralogy, paleontology, petroleum geology, petrology, quantitative geology, sedimentology, structural geology, and surficial geology.

Prerequisite(s): 78 units (13 full-course equivalents) and consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Graduate students are urged to read the Geoscience Department section in the Graduate Studies calendar. Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599. Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geology 601 **3 units; H(3-2)**

Advanced Physical Hydrogeology
An advanced treatment of topics covered in Geology 401.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Geology 601 and 401 will not be allowed.

Geology 605 **3 units; H(3-2T)**

Groundwater Flow and Transport Modelling
Review of the partial differential equations and boundary conditions that describe groundwater flow and transport. Introduction to numerical methods. The course emphasizes the practical aspects of building groundwater and transport models using computer exercises and a groundwater modelling project.

Prerequisite(s): Geology 401 or 601.

Geology 607 **3 units; H(3-0)**

Advanced Physical Hydrology
Coverage of more advanced topics in the physical hydrology of surface and subsurface waters including land-atmosphere exchange, vadose zone processes, and watershed hydrology.

Prerequisite(s): Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219 and Geography 415 and Geology 401.

Geology 609 **3 units; H(3-3)**

Advanced Contaminant Hydrogeology
An advanced treatment of topics covered in Geology 505.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Geology 609 and 505 will not be allowed.

Geology 611 **3 units; H(2-2)**

Groundwater Resource Management
Advanced topics related to groundwater resource development and management, including exploration methods, aquifer test analysis, aquifer-aquitard systems, groundwater recharge, and the role of models. Fundamental issues related to regional integrated management of water resources.

Prerequisite(s): Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219 and Geology 401 or Geography 415.

Geology 613 **3 units; H(3-1T-3)**

Flow in Porous Media
Fundamentals of fluid flow in porous media: pore structure; capillarity; single phase flow; immiscible and miscible fluid flow; pore level modelling of porous media. Concepts applied to hydrocarbon reservoirs and fluid migration in soils including: characterization of pore space, single phase flow in porous media, capillarity, wettability, routine and advance core analysis, miscibility in porous media. Similarities and differences between hydrocarbon reservoirs and soils. Introduction to enhanced oil and gas processes.

Prerequisite(s): Chemical Engineering 331 or Geology 401.

Antirequisite(s): Credit for Geology 613 and either 699.20 or Petroleum Engineering 513 will not be allowed.

Geology 623 **3 units; H(3-3)**

Modern Diffraction and Scattering Techniques
Space groups and principles of X-ray, neutron, and electron diffraction and their applications. Crystal structure determination and refinement using single crystal and Rietveld methods. X-ray and neutron scattering techniques (using the Pair Distribution Function, PDF) to examine local disorder in nano-materials and glasses. Phase transition and structural evolution with pressure, temperature, and composition. Analyses of experimental data sets and extensive use of computers.

Prerequisite(s): Geology 523 or equivalent.

Note: Offered every alternate Fall Term

Geology 627 **3 units; H(3-3)**

Advanced Topics in Ore Deposits
A detailed study of ore occurrences with special emphasis on Canadian deposits. Laboratory: the study of comprehensive suites from deposits.

Prerequisite(s): Geology 527.

Geology 633 **3 units; H(3-3)**

Advanced Petrologic Methods
Theoretical and applied problems in petrology, including some or all of: numerical techniques in petrology, phase equilibria, geothermometry and geobarometry, kinetics in petrology, physics and chemistry of magmatic processes. Laboratory will consist of petrographic study of rock suites.

Prerequisite(s): Geology 543.

Geology 639 **3 units; H(160 hours)**

Field Laboratory in Groundwater Hydrogeology
Entails a week at a hydrogeology field site in Alberta or British Columbia. Hydrogeology and geotechnical techniques will be demonstrated and will involve hands-on participation by students. After the field work, students will conduct extensive analysis and interpretation of data gathered during the field session, complete exercises and prepare a written report. Relative to Geology 441, Geology 639 requires more sophisticated analyses of data and additional exercises.

Prerequisite(s): Geology 401 or 601 and consent of the Department.

Antirequisite(s): Credit for Geology 639 and 441 will not be allowed.

Note: This course has limited enrolment. This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geology 641 **3 units; H(3-3)**

Advanced Structural Methods
Analysis of mesoscopic and megascopic structural data; the construction and analytical use of cross-sections, subsurface maps and 3-dimensional models; structural analysis of the Canadian Cordillera.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Geology 641 and 541 will not be allowed.

Note: There may be a week-end field excursion during the term.

Geology 655 **3 units; H(3-0)**

Unconventional Gas Reservoir Characterization and Evaluation
Overview of the unique storage and production mechanisms associated with coalbed methane, tight gas and shale gas reservoirs; adsorbed gas storage and modelling; gas-in-place determination and volumetric reserves estimation; material balance techniques; fracture and matrix flow mechanisms; completion/stimulation methods; reservoir characterization methods including core analysis, rate-transient and pressure-transient analysis; exploration and development concepts.

Prerequisite(s): Petroleum Engineering 523 or consent of the instructor.

Antirequisite(s): Credit for Geology 655 and 699.37 will not be allowed.

Geology 663 **3 units; H(2-1)**
(Physics 663)

Applications of Stable Isotopes
Application of stable isotope techniques with special focus on Hydrogeology, Geology and Environmental Sciences. The use of isotopes to understand the water, carbon, nitrogen and sulphur cycles is demonstrated. Topics include hydrology, paleoclimates, geothermometry, fossil fuels exploration and recovery, pollutant tracing, food webs, forensic investigations, among others.

Prerequisite(s): Consent of the Department.

Geology 675 **3 units; H(3-0)**

Advanced Topics in Dinosaur Paleontology
Topics related to the paleobiology, paleoecology, and paleoenvironments of the Dinosauria will be covered.

Prerequisite(s): Consent of the Department or enrolment in a paleontology-based graduate program.

Geology 677 **3 units; H(3-3)**

Advanced Topics in Oil and Gas Production
Advanced study of the problems related to production of conventional oil, heavy oil, and natural gas; analysis of interactions of oil, water and gas; the effects of fluid properties, rock structure and capillary, gravity and viscous forces acting on the reservoir system; application to the design of improved oil and gas recovery methods. New processes in oil and gas recovery.

Prerequisite(s): Petroleum Engineering 513 or Geology 613.

Antirequisite(s): Credit for Geology 677 and either Chemical Engineering 619.26 or 677 will not be allowed.

Geology 679 **3 units; H(3-1)**

Petroleum and Environmental Organic Geochemistry
Origin of petroleum; sedimentation of organic matter and the carbon cycle; diagenesis of organic matter; hydrocarbon generation and migration; kinetic models; creosote contamination; methods; interpretation of geochemical data; applications of geochemical data to geological and environmental problems.

Prerequisite(s): Consent of the Department.

Geology 697 **3 units; H(3-3)**

Advanced Geostatistics
Advanced treatment of the topics covered in Geology 597.

Prerequisite(s): Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219 and Mathematics 211.

Antirequisite(s): Credit for Geology 697 and 597 will not be allowed.

Note: Completion of Mathematics 331 and/or Statistics 357 or 327 is recommended prior to taking this course.

Geology 698 **6 units; F(3-0)**
(Chemical Engineering 698)

Reservoir Characterization for Field Development
A team-based, integrated reservoir description experience working with geophysical, geological, petrophysical, and engineering data to produce a field development plan.

Prerequisite(s): Chemical Engineering 621 and Geology 697 and Human Resources and Organizational Dynamics 789 or equivalent.

Note: This course is intended for graduate students in the Master of Science in Geology or Geophysics with a specialization in Reservoir Characterization.

Geology 699 **3 units; H(3-3)**

Selected Topics in Geology
Courses are offered in specific topics in areas such as geochemistry, hydrogeology, mineralogy, paleontology, petroleum geology, petrology, quantitative geology, sedimentology, structural geology, and surficial geology.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geology 701 **3 units; H(0-6)**

Advanced Independent Study
A written report based on laboratory and field studies is required.

Note: Open only to graduate students in the Department of Geoscience.

Geology 703 **3 units; H(0-6)**

Readings in Geology
A written report based on a literature review is required.

Note: Open only to graduate students in the Department of Geoscience.

Geology 707 **3 units; H(2-2)**

Geology and Geophysics of Western Canada
Topics include stratigraphy, sedimentology, structure, petrology, geophysics and economic geology. Laboratories contain a field component.

Note: Open only to graduate students in the Department of Geoscience and compulsory for beginning doctoral students in Geology.

Geology 709 **3 units; H(3S-3)**

Seminars on Applied Basin Studies
A seminar-based course that will cover topics that consider the development, evolution, stratigraphic and sedimentologic architecture, and stratigraphic correlation of sedimentary basins. Topics could include biostratigraphy, tectonics and sedimentation, subsurface correlation including sequence stratigraphy, siliciclastic and carbonate sedimentology, geochronology and petroleum geology. Concepts will be developed from discussions, assigned reading, seminars and field trips to local geological sites.

Prerequisite(s): Graduate student registration in the Department of Geoscience.

Geology 711 **3 units; H(3S-3)**

Seminars on Applied Basin Field Studies
A seminar-based course that will consider the entire geologic history of a particular basin or sub-basin as well as key sections or geological sites that will be visited at the end of the semester. Topics will range across the full discipline of sedimentary geology with emphasis on applications to Petroleum Geology.

Prerequisite(s): Graduate student registration in the Department of Geoscience.

Geology 729 **3 units; H(3-3)**

Sedimentary Geochemistry
Application of chemical and isotopic data and techniques to the mineral assemblages observed to form during diagenesis. Water-rock interactions are examined using the thermodynamics of solution-mineral-gas equilibria. Topics may include kinetics, reaction path modelling, fluid flow in sedimentary basins and the relationships between fluid flow and diagenetic events.

Geology 733 **3 units; H(3-0)**

Analytical Methods in Petrology
Topics may include scanning electron microscope, electron probe, x-ray diffraction and x-ray fluorescence.

Geomatics Engineering ENGO

Instruction offered by members of the Department of Geomatics Engineering in the Schulich School of Engineering.

Geomatics Engineering 103 **1.5 units; Q(32)**

Survey Block Week
Instrument calibration, resection, traverse, levelling, topographic survey and map generation, graphical methods of estimation and communication, least squares and error propagation. Students are expected to complete readings and calculation exercises prior to the course.

Prerequisite(s): Geomatics Engineering 343 and 361.

NOT INCLUDED IN GPA

Senior Courses

Geomatics Engineering 327 **3 units; H(3-1.5T)**

Spectral Analysis in Geomatics
Continuous signals and systems and their properties. Frequency analysis and Fourier series. The continuous Fourier transform (CFT) and its properties. Convolution, correlation and power spectral density functions. Discrete signals and systems and their properties. The discrete Fourier transform (DFT). Sampling theory, aliasing and truncation effects. Linear and circular convolution and correlation. The fast Fourier transform (FFT). The two-dimensional CFT and DFT. Applications of spectral analysis in geodesy, remote sensing, digital imaging, positioning and navigation.

Prerequisite(s): Mathematics 375 or Applied Mathematics 307.

Antirequisite(s): Electrical Engineering 327.

Geomatics Engineering 333 **3 units; H(3-2)**

Computing for Geomatics Engineers
Review of procedural programming and introduction to object-based programming using high level compiled and interpreted languages. Binary and ASCII File I/O, use of function libraries and class libraries. Construction of simple classes. Inheritance and polymorphism. Programming for Geomatics Engineering applications. Visualization and data representation.

Prerequisite(s): Engineering 233.

Geomatics Engineering 343 **3 units; H(3-3)**

Fundamentals of Surveying
Levelling: differential, trigonometric and GNSS-levelling. Angular measurements and introduction to gyrotheodolites. Distance measurements by taping, optical methods and EDM. Precision and accuracy of survey observations. Computations: polygon traverse and area, the first and second

geodetic problem on the plane, trig sections, intersections, three-point resection and redundant observations, and co-ordinate transformations. Route surveying: horizontal and vertical curves, earthwork computations. Routine procedures: setting out straight lines and right angles; measurement with obstructions; setting out surveys; and topographic surveys.

Prerequisite(s): Engineering 319.

Geomatics Engineering 351 3 units; H(3-3)

Introduction to Geospatial Information Systems
Introduction to Geospatial Information Systems and Geographic Information Science, Georelational vector data model, object-based vector data model, raster data model, map projections, geodetic datums, co-ordinate systems, georeferencing, database design and management, query language, geometric transformations, vector data analysis, raster data analysis, spatial interpolation, terrain modelling and analysis, triangulated irregular network data model, path and network analysis, temporal GIS.

Prerequisite(s): Engineering 233.

Geomatics Engineering 361 3 units; H(3-3)

Least Squares Estimation
Familiarization with Geomatics engineering methodology and estimation. Classes and combination of mathematical models. Least squares method: parametric, condition and combined cases. Problem formulation and solution: theory of errors and adjustment of observations, analysis of trend, problems with a priori knowledge of the parameters, step by step methods, sequential solution methods, summation of normals. Introduction to univariate and multivariate statistical testing applied to Geomatics engineering problems.

Prerequisite(s): Mathematics 211, Geomatics Engineering 333 and Engineering 319.

Geomatics Engineering 419 3 units; H(3-3)

Geomatics Networks
A systematic approach to "Geomatics Network Analysis and Optimal Design", which are two of the most important processes in establishing a Geodetic Network. Network observation reductions and pre-analysis. Network co-ordinate systems, observation models and least-squares adjustment. Network precision, reliability measures and analysis. Network design concepts, classification and methods. Network design for deformation monitoring and analysis. Other geodetic network applications. New network concepts.

Prerequisite(s): Geomatics Engineering 361.

Geomatics Engineering 421 3 units; H(3-3)

Co-ordinate Systems
Fundamental concepts, definitions and basic aims of geodesy. Representation of the Earth's surface: physical and mathematical figures of the Earth, geodetic reference systems, frames and co-ordinates, reference ellipsoids and geodetic datums, maps. Time systems, basic motions of the Earth, dynamic behaviour of the Earth. Basic types of geodetic reference systems, computational procedures and co-ordinate transformation methods. Celestial co-ordinate systems and astronomic positioning. Elements of map projections, examples and applications.

Prerequisite(s): Geomatics Engineering 333 and 351.

Geomatics Engineering 423 3 units; H(3-3)

Geodesy
Introduction to geodesy, its principles, tasks and applications. Measurements and methods for geodetic positioning. The gravity field and the geoid in science and engineering. Elements from potential theory, vector calculus, Gauss divergence, Green's theorems, boundary value problems. The normal field. Gravimetry. Gravity reductions, isostasy. Geoid determination, Stokes's formula, combination methods. Vertical positioning and height systems. Fundamentals of Earth's figure and gravity field estimation using perturbations of orbits of satellites and planets. Principle and applications of satellite gravimetry and satellite altimetry.

Prerequisite(s): Geomatics Engineering 421 and one of Geomatics Engineering 327 or Electrical Engineering 327.

Geomatics Engineering 431 3 units; H(3-3)

Principles of Photogrammetry
The role of photogrammetry in mapping applications (image acquisition and image measurement). Mathematical relationships between image space and object space. Two- and three-dimensional coordinate transformations. Conditions of collinearity and coplanarity; orientation procedures (interior, exterior, relative, absolute orientation and direct georeferencing); measurement and correction of image co-ordinates; stereomodel formation and error analysis; mathematical models for strip and block adjustments; project planning; principles of laser scanning.

Prerequisite(s): Geomatics Engineering 419.

Geomatics Engineering 435 3 units; H(3-3)

Remote Sensing
A survey of modern quantitative remote sensing using optical, infrared and microwave radiation. Topics include: physical principles, including governing equations; imaging system geometries; radiometric corrections, including calibration and atmospheric correction; geometric corrections, including registration and land cover classification algorithms, including accuracy assessment and geospatial data integration.

Prerequisite(s): Geomatics Engineering 333 and 351.

Geomatics Engineering 443 3 units; H(2-4)

Geodetic and Engineering Surveys
Instrument systems and procedures for engineering and geodetic surveys: precise levels, high-precision theodolites, electronic distance measurement instruments, gyro-theodolites. Heighting, triangulation, instrument calibration, observation procedures and reductions, introductory deformation analysis, error analysis, survey computations, map projection computations, heighting using satellite systems.

Prerequisite(s): Geomatics Engineering 343 and Geomatics Engineering 361.

Corequisite(s): Geomatics Engineering 103.

Geomatics Engineering 451 3 units; H(3-3)

Design and Implementation of Geospatial Information Systems
Overview of Geographical Information Systems from a computing perspective. Topics include: Fundamental Database Concepts: relational algebra, UML modelling, and SQL; Fundamental Spatial Concepts: Geometry, Euclidean space, topological space, set notations, point set topology, and base graph theory; Models for Geospatial Information: object models and field models; Representations and Algorithms for GIS: computational complexity, discretization algorithms, topological data models and algorithms, TIN model, and computational geometry algorithms for GIS; Spatial Access Methods: B-Tree, Quadtree, and R-Tree; and Architechtures; centralized and decentralized architectures.

Prerequisite(s): Geomatics Engineering 351.

Corequisite(s): Communications Studies 363.

Geomatics Engineering 455 3 units; H(3-3)

Land Tenure and Cadastral Systems
Land tenure, cadastral systems, real property law, methods of acquiring rights in land, boundary concepts, cadastral survey computations, land registration systems, entity relationship models of land tenure systems, case law of boundary systems. History of cadastral systems, land administration, fiscal and juridical cadastres, dominion land systems, land registration in Alberta, special types of surveys relating to Canada Lands, structure of professional surveying bodies in Canada.

Prerequisite(s): Geomatics Engineering 103 and 421 and Communications Studies 363.

Geomatics Engineering 465 3 units; H(3-3)

Satellite Positioning
Satellite orbit motion and Kepler's laws. Description of GPS signal structure and derivation of observables. Characteristics of instrumentation. Analysis of atmospheric, orbital and other random and non-random effects. Derivation of mathematical models used for absolute and differential static and kinematic positioning. Pre-analysis methods and applications. Concept of Kalman filtering applied to kinematic positioning. Ambiguity resolution procedures Overview of other GNSS, GNSS augmentation and high-sensitivity receivers Introduction to inertial navigation.

Prerequisite(s): Geomatics Engineering 103, 361, and 421.

Corequisite(s): Geomatics Engineering 423.

Geomatics Engineering 500 6 units; F(1-5)

Geomatics Engineering Project
Principles of project management and applications in geomatics projects. Group project, under the supervision of a faculty member, on an assigned Geomatics Engineering topic. The project will normally involve a literature review, theoretical work, and laboratory or field work.

Prerequisite(s): Communications Studies 363.

Corequisite(s): Geomatics Engineering 501.

Geomatics Engineering 501 3 units; H(152 hours)

Field Surveys
Field exercises include: instrument calibration, cadastral retracement, determination of astronomic azimuth, conventional control survey for deformation analysis, real time kinematic surveying, geodetic control using static GPS, precise levelling, hydrographic surveying, and geographic information systems and data management. This course adopts a team-based learning approach and emphasis is placed on practical professional experience, planning, and logistic for field survey operations. Each team is required to produce a field work report for each field activity, and each student is responsible for a chapter, detailing one of the exercises, of the primary team report describing all of the work accomplished by the team during the course. The course concludes with a half-day seminar that focuses on the practice and profession of Land Surveying.

Prerequisite(s): Geomatics Engineering 103, 419, 435, 455, 465 and 451 or 443.

Note: A two-week field camp will be held at the Biogeoscience Institute at Barrier Lake prior to the start of the Fall Term lectures. Students will be assessed a supplemental fees to cover the costs of the field camp.

Geomatics Engineering 531 3 units; H(2-2)

Advanced Photogrammetric and Ranging Techniques

Analogue and digital imaging systems, frame versus line cameras, stereo-coverage configurations of line cameras, geometric modelling of line cameras (rigorous versus approximate sensor modelling), geo-referencing requirements of frame and line cameras, high-resolution imaging satellites, active imaging systems (LIDAR/RADAR), data integration and fusion.

Prerequisite(s): Geomatics Engineering 421, 431, and 435.

Geomatics Engineering 545 3 units; H(2-3)

Hydrographic Surveying

Water levels and flow. Underwater acoustics including velocity and system parameters. Sonar and echosounder systems. Acoustic positioning concepts. Vertical positioning and datums. Types of surveys and specifications. Practical examples and survey data processing.

Prerequisite(s): Geomatics Engineering 361 and 465.

Geomatics Engineering 551 3 units; H(2-2)

Advanced Geospatial Topics

Progress in research, development and applications in the field of geospatial technologies; importance of geospatial knowledge and evolution of geospatial technologies in the last decades; focus on six major geospatial technologies that characterize the so-called Geospatial Revolution; Geoweb, Virtual Globes, Volunteered Geographic Information, Location-Based Services, Big data and geospatial cyber-infrastructure; data/product quality, privacy and confidentiality, and societal implication of these technologies will be discussed.

Prerequisite(s): Fourth-Year Standing.

Geomatics Engineering 559 3 units; H(2-2)

Digital Imaging and Applications

An introduction to digital image processing (IP) and computer vision (CV) concepts, methods and algorithms which will enable the students to implement IP/CV systems or use IP/CV software with emphasis on remote-sensing and photogrammetry applications and problem solving. Course components include: image formation and intensity transformation, filtering in the spatial and frequency domain, colour image processing, feature detection and matching, image restoration, image segmentation, mathematical morphology and multi-source image/data fusion.

Prerequisite(s): Geomatics Engineering 435 and one of Geomatics Engineering 327 or Electrical Engineering 327.

Geomatics Engineering 563 3 units; H(2-2)

Data Analysis in Engineering

Fundamental of matrix theory, linear systems, probability and statistics. Data classification, analysis and bias identification. Random data acquisition, qualification and analysis. Least squares estimation and data analysis. Random process, stationarity test and kinematic modelling. Kalman filtering and real-time data analysis. Introduction to signal processing and time series analysis. Practical applications of data analysis and processing in geomatics engineering.

Prerequisite(s): Geomatics Engineering 361.

Geomatics Engineering 567 3 units; H(2-3)

High-Precision Surveys

Instrument systems and procedures for high-precision surveys: precise levels, high-precision theodolites, electronic distance measurement instruments. High-precision industrial surveys: computation of three-dimensional orientations and rotations by autoreflection and autocollimation; computation of three-dimensional co-ordinates and co-ordinate changes by theodolite intersection methods, total station methods, scale bar on target methods, digital camera methods, laser scanner methods; systematic errors and their control; geometric form fitting. Case studies in high precision surveys.

Prerequisite(s): Geomatics Engineering 419 and 443.

Geomatics Engineering 573 3 units; H(2-2)

Digital Terrain Modelling

Digital Terrain Modelling (DTM, DEM, DHM, DTEM) concepts and their implementation and applications in geomatics engineering and other disciplines. Emphasis will be on mathematical techniques used in the acquisition processing, storage, manipulation, and applications of DTM. Models of DTM (Grids, Contours, and TINS), data structures (Delaunay trainagulation, Voronoi diagram, Octree, k-D tree) processing (filtering, random sample concensus, surface normal computation), surface representation from point data using moving averages, linear projection, and Kriging techniques. Grid resampling methods and search algorithms used in gridding and interpolation. DTM derivatives (slope maps, aspect maps, viewsheds, and watershed). Applications of DTM in volume computation, and drainage networks.

Prerequisite(s): Engineering 407 and Geomatics Engineering 431.

Geomatics Engineering 579 3 units; H(2-3)

Survey Law and Practice

Review of legislation, standards of practice and case law affecting property interests, property boundaries and boundary surveys. Evidence and Boundary Survey Principles, Riparian rights, Title to land, Canada lands, Aboriginal rights, interjurisdictional boundaries. Reforms in the Surveying Profession. Field exercises may take place off campus over weekends.

Prerequisite(s): Geomatics Engineering 455 and 443.

Corequisite(s): Geomatics Engineering 501.

Geomatics Engineering 581 3 units; H(2-2)

Land Use Planning

Theoretical and historical bases of planning. Urban reform and development of planning in Canada. Sustainable development. Subdivision planning process. Provincial and municipal planning approval requirements. Public participation. Site assessments. Field exercises may take place off campus over weekends.

Prerequisite(s): Geomatics Engineering 579.

Geomatics Engineering 583 3 units; H(2-2)
(Environmental Engineering 635)

Environmental Modelling

Nature and purpose of environmental modelling; the top-down and the bottom-up approaches; typology of environmental models; definition of fundamental concepts; steps involved in designing and building a model; calibration, verification and validation of models; scale dependency; sensitivity analysis; characteristics, architecture and functioning of selected environmental models.

Prerequisite(s): Fourth year standing.

Geomatics Engineering 585 3 units; H(2-2)

Wireless Location

Fundamentals of radio-frequency propagation, principles of radio-frequency positioning, observations and their associated error sources. Introduction to self-contained inertial sensors including odometers, gyros, accelerometers, and augmentation of RF methods with self-contained sensors and other data sources. Current systems: Assisted GPS, cellular telephone location techniques, pseudolites, location with wireless computer networks, ultra-wideband. Applications: outdoor and indoor personal location, asset tracking.

Prerequisite(s): Geomatics Engineering 465 and one of Geomatics Engineering 327 or Electrical Engineering 327.

Graduate Courses

Following are the graduate courses normally offered in the Department. Additional courses are also offered by visiting international lecturers. Please refer to the Department website (geomatics.ucalgary.ca) for current course listings.

Geomatics Engineering 601 3 units; H(0-4)

Graduate Project

Individual project in the student's area of specialization under the guidance of the student's supervisor. A written proposal, one or more written progress reports, and a final written report are required. An oral presentation is required upon completion of the course.

Note: Open only to students in the course-based route MEng.

Geomatics Engineering 615 3 units; H(3-0)

Advanced Physical Geodesy

Potential theory and geodetic boundary value problems (GBVPs). Solution approaches to the Molodensky problem. Least-squares collocation (LSC). Hilbert spaces with kernel functions. Variational principles, improperly posed problems and regularization. The altimetry-gravimetry and overdetermined GBVPs. Solution of GBVPs by integral techniques, fast Fourier transforms and LSC. Use of heterogeneous data sets and noise propagation. Applications to gravity prediction, geoid determination, deflection estimation, satellite altimetry and airborne gravimetry and gradiometry. Current research activities.

Geomatics Engineering 617 3 units; H(3-0)

Participatory Geographic Information Systems (PGIS)

Introduction of methods to engage in effective dialogue and advocacy through the adoption of Participatory Geographic Information Systems (PGIS). Approaches learned to safeguard culturally sensitive information from external misuse and exploitation; methods to ensure traditional custodians maintain control of their spatial information; methods for producing, georeferencing and visualizing (indigenous) spatial knowledge that promote peer-to-peer dialogue, and their aspirations and concerns with higher-level authorities. The course will be a workshop forward that incorporates readings and various group exercises to provide students with a road make to undertaking PGIS.

Geomatics Engineering 620 3 units; H(2-2)

Estimation for Navigation

Overview of estimation fundamentals including stochastic processes, covariance matrices, autocorrelation functions, power spectral densities, and error propagation. Review of least-squares estimation, summation of normals and sequential least-squares formulations, and role of measurement geometry in least-squares position estima-

tion. Constraints and implementations. Concept of Kalman filtering; relationship between Kalman filtering and least-squares; linear, linearized and extended Kalman filter formulations; system model formulation; process noise model determination; measurement models, and effect of time-correlated measurements and possible remedies. Numerical stability issues in estimation and possible solutions. Statistical reliability in least-squares and Kalman filtering and related RAIM concepts. Introduction to other estimation techniques including unscented Kalman filters and particle filters. Application of above topics to relevant navigation estimation problems.

Geomatics Engineering 623 3 units; H(3-0)

Inertial Surveying and INS/GPS Integration
Inertial sensors and their application in inertial navigation, existing inertial systems, new developments in strapdown technology. Practical aspects of inertial positioning definition of an operational inertial frame, inertial error models. Effect of inertial sensor errors on the derived navigation parameters, performance characteristics of inertial sensors, calibration of inertial sensors. Mechanization equations in different co-ordinate frames, step by step computation of the navigation parameters from the inertial sensor data introduction to Kalman filtering for optimal error estimation, modelling INS errors by linear state equations, practical issues for the implementation of update measurements (ZUPT, CUPT, Integrated systems), current research activities.

Geomatics Engineering 625 3 units; H(3-2)

Advanced GNSS Theory and Applications
Overview of space positioning and navigation systems; concepts and general description. Global Navigation Satellite System signal description. Receiver and antenna characteristics and capabilities; signal measurements indoor; GNSS error sources and biases; atmospheric delays, signal reflection and countermeasures. Mathematical models for static point and relative positioning. Kinematic single point and differential post mission and real time positioning, navigation and location. Augmentation methods. Land, marine, airborne and indoor applications. Case studies.

Geomatics Engineering 629 3 units; H(3-0)

Advanced Estimation Methods and Analysis
Introduction of different estimation criteria, error sources in estimation, modelling and testing requirements. Advanced least squares method, estimation equations and analysis. Random processes, dynamic models, Kalman filter equations and analysis. Implementation aspects. Concept of signal, least squares collocation equations and applications. Robust estimation principle and robustified least squares and Kalman filter. Data modelling issue in estimation, functional and stochastic model development for least squares and Kalman filter. Error analysis, conventional and robust statistical testing methods and analysis. Applications to geomatics engineering problems in geodesy, positioning and navigation, photogrammetry, etc.

Geomatics Engineering 633 3 units; H(3-0)

Atmospheric Effects on Satellite Navigation Systems
Theoretical and observed aspects of radio wave propagation in the ionosphere and troposphere, with an emphasis on L-band (GPS) signals. Fundamentals of absorption, attenuation, depolarization, and defraction will be covered, in addition to characteristics and physical properties of the propagation medium and atmospheric constituents. The impact of such effects, and methods of mitigation, will be interpreted with respect to satellite navigation applications.

Geomatics Engineering 637 3 units; H(3-0)
(Environmental Engineering 637)

Earth Observation for the Environment
An introduction to environmental earth observation systems in particular to satellite platforms. Topics include: discussion of physical principles, including governing equations; imaging system geometries; radiometric corrections, including calibration and atmospheric correction; spatial filtering for noise removal and information extraction; geometric corrections, including rectification and registration; fusion of multi-dimensional datasets (i.e., multispectral, multi-temporal, multi-resolution, and point-source ground data); and application of satellite images in addressing selected environmental issues.

Antirequisite(s): Credit for any of Environmental Engineering 637 or 619.05 and Geomatics Engineering 637 and 655 will not be allowed.

Geomatics Engineering 638 3 units; H(2.5-1)

GNSS Receiver Design
Global Navigation Satellite System signal structure, overview of receiver architecture, measurements, antenna design, receiver front-end, reference oscillator, sampling and quantization, phase lock loops, frequency lock loops and delay lock loops, tracking loop design and errors, signal acquisition and detection, interference effects.

Geomatics Engineering 639 3 units; H(3-0)

Advanced Topics in Digital Image Processing
Review of basic digital imaging; advanced topics in multispectral or hyperspectral analysis, multiresolution analysis, image segmentation, image transform, data fusion, pattern recognition or feature matching; current research applications especially in Geomatics.

Geomatics Engineering 642 3 units; H(3-0)

Optical Imaging Metrology
Optical imaging methods for precise close-range measurement. Photogrammetric techniques with emphasis on the bundle adjustment. Photogrammetric datum definition, network design and quality measures. Principles of laser rangefinding and laser scanning. Imaging distortions, sensor modelling and system self-calibration for a variety of imaging sensors including digital cameras, panoramic cameras, 3D laser scanners and 3D range cameras. Automated point cloud processing methods; registration, modelling and segmentation. Selected case studies.

Geomatics Engineering 645 3 units; H(3-0)

Spatial Databases and Data Mining
Comprehensive overview of spatial database management systems and issues related to spatial data mining. The topics that will be covered include: overview of spatial databases, spatial concepts and data models, spatial query languages, spatial storage and indexing, spatial networks, spatial data mining, and trends in spatial databases.

Geomatics Engineering 658 3 units; H(3-0)

Geocomputation
Overview of the fundamental concepts, approaches, techniques, and applications in the field of Geocomputation. Topics being discussed include Geocomputation, Computational intelligence, Complex Systems theory, Cellular automata modelling, Multi-agent system modelling, Calibration and validation of dynamic models, Scale, Artificial neural network, Data mining and knowledge discovery, Geovisualization, and Post-normal science. Individual projects involving the application of Geocomputational techniques and models are conducted.

Geomatics Engineering 667 3 units; H(3-0)

Advanced Topics in Photogrammetry
Overview of aerial triangulation procedures (strip triangulation, block adjustment of independent models, bundle block adjustment, automatic aerial triangulation, direct versus indirect orientation). Mapping from space (modelling the perspective geometry of line cameras, epipolar geometry for line cameras). Multi-sensor aerial triangulation (integrating aerial and satellite imagery with navigation data). Photogrammetric products (Digital Elevation Models, ortho-photos). The role of features in photogrammetric operations (utilizing road network captured by terrestrial navigation systems in various orientation procedures).

Geomatics Engineering 675 3 units; H(3-0)

Spatial Statistics
Spatial phenomena and spatial processes. Spatial data analysis and the importance of spatial data in scientific research. Methods will range from exploratory spatial data analysis through to recent developments such as nonparametric semivariogram modelling, generalized linear mixed models, estimation and modelling of nonstationary covariances, and spatio-temporal processes.

Geomatics Engineering 681 3 units; H(3-0)
(Geophysics 681)

Advanced Global Geophysics and Geodynamics
Elasticity, figure of the Earth, Earth structure and seismology, gravity and its temporal variations, isostasy, tides, Earth rotation and orientation, time, plate flexure, glacial rebound, continental drift, geodetic observation methods for geodynamics.

Geomatics Engineering 691 3 units; H(3-0)

Polarimetric Synthetic Aperture Radar
Introduction to image formation with polarimetric synthetic aperture radar (POLSAR), theory of polarized electromagnetic waves, polarimetric scattering from targets, POLSAR data models, speckle filtering, data decomposition, classification, and segmentation.

MAY BE REPEATED FOR CREDIT

Geomatics Engineering 693 3 units; H(3-0)

Cadastral Information Systems
Cadastral Systems, cadastral data, land registration, data structures and schemas for land administration information, ISO standards, evolutionary models, land tools, effectiveness metrics.

Geomatics Engineering 694 3 units; H(3-0)

Advanced Topics in Sensor Web and Internet of Things
Overview of the sensor web architecture and algorithms, with a focus on Internet of Things. The topics that will be covered include: sensor web data management, sensor web search and discovery, sensor web server design and implementation, interoperability issues, sensor-based analytics and visualization, introduction to sensor networks, and trends in sensor web and Internet of Things.

Geomatics Engineering 697 3 units; H(3-0)

Directed Studies
Individual project study conducted under the guidance of a faculty member and intended to familiarize the student with the literature and techniques

that are required for their research program, but are not available in regular courses.

Prerequisite(s): Consent of the Department Head or Associate Head Graduate Studies.

MAY BE REPEATED FOR CREDIT

Geomatics Engineering 698 3 units; H(3S-0)

Professional Development Seminar
This professional development seminar aims at providing relevant skills to be a successful graduate student and to make a smooth transition to a rewarding professional career. In addition to efficient communication skills, this course will place an emphasis on research methodologies such as formulating research problems, preparing a scholarship application, writing a paper for publication, and defending a thesis. How to prepare for a successful interview in industry or academia and the required process for becoming a professional engineer will also be discussed.

NOT INCLUDED IN GPA

Geomatics Engineering 699 3 units; H(3-0)

Special Studies
Focus on advanced studies in specialized topics that are not offered in the regular graduate curriculum of the Department.

MAY BE REPEATED FOR CREDIT

Geophysics GOPH

Instruction offered by members of the Department of Geoscience in the Faculty of Science.

Senior Courses

Geophysics 351 3 units; H(3-3)

Introduction to Geophysics
The key geophysical concepts and methods that are used to study the Earth and solve various geoscientific problems. Includes: earthquake seismology, gravity and magnetism, figure of the Earth, isostasy, heat flow, reflection and refraction seismology, radioactivity and geochronology, geodynamics, applications and case studies.

Prerequisite(s): Geology 201, and 202 or 203; Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219; Physics 211 or 221, and 223.

Antirequisite(s): Credit for Geophysics 351 and 359 will not be allowed.

Geophysics 355 3 units; H(3-3)

Exploration Geophysics
An introduction to refraction seismic, reflection seismic, gravity and magnetic methods applied to exploration for hydrocarbons, and their use in engineering studies.

Prerequisite(s): Geology 201; Geology 202 or 203; Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219; Physics 211 or 221, and 223.

Antirequisite(s): Credit for Geophysics 355 and 365 will not be allowed.

Geophysics 375 3 units; H(3-0)

Natural Disasters and Critical Earth Phenomena
Causes of disasters such as earthquakes, tsunami, volcanic eruptions, mud flows, landslides, avalanches, flooding, tornadoes and hurricanes, and other critical phenomena such as sinkholes, ozone depletion and radiation, carbon dioxide and global warming, El Nino, toxic natural materials and pollution, and extraterrestrial impacts. Surveys of historic disasters and their effects on life on Earth. Methods of prediction and prevention of disasters and precautions for the mitigation of their effects.

Note: A non-major course for students in all faculties. Not available as a course in the Field of Geophysics.

Geophysics 453 3 units; H(3-3)

Mining Geophysics
Electromagnetic, resistivity, induced polarization, self-potential, radiometric and gravity methods applied to problems in the search for metallic mineral deposits.

Prerequisite(s): Geology 201, Physics 223, Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219, and Mathematics 211.

Geophysics 457 3 units; H(3-3)

Physical Properties of Rocks
Physical properties of minerals and rocks, their relationship to geophysical measurements and surveys.

Prerequisite(s): Geophysics 351 or 355 or 359; Mathematics 331; Physics 321.

Geophysics 509 3 units; H(0-9)

Independent Study
Senior thesis. A written report based on independent study. Originality is emphasized, laboratory and field studies are encouraged. Published material may be included.

Prerequisite(s): Consent of the Department and of a Departmental faculty member who will act as a supervisor.

MAY BE REPEATED FOR CREDIT

Geophysics 517 3 units; H(3-3)

Time Series Analysis and 1D Data Processing
Analysis of geophysical time series, especially real and synthetic seismic signals, is introduced using theoretical concepts and their practical application in a computational lab using commercial computational software.

Prerequisite(s): Geophysics 355, Mathematics 211, and Applied Mathematics 415.

Geophysics 547 3 units; H(3-3)

Gravity and Magnetics
The nature of the magnetic and gravitational fields of the earth. Theory and applications of the gravity and magnetic methods of geophysical exploration.

Prerequisite(s): Geophysics 351 or 355 or 359; Mathematics 331; and Applied Mathematics 415.

Geophysics 549 3 units; H(1T-96 hours)

Field School
Seismic, gravity, magnetic, electromagnetic, resistivity, induced polarization and topographic surveys will be conducted for about 10-12 days prior to the Fall Term. Data collected will be processed during Fall Term tutorials.

Prerequisite(s): Geophysics 355, 453 and 457 and consent of the Department.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Geophysics 551 3 units; H(3-3)

Seismic Theory and Methods
Seismic wave propagation theory; various techniques of exploration seismology.

Prerequisite(s): Geophysics 355, Physics 321, 323, Mathematics 211, Applied Mathematics 415, and Mathematics 331.

Geophysics 557 3 units; H(3-3)

Multidimensional Data Analysis and Processing
Analysis and processing of 2D and 3D seismic data is explored using theoretical and practical concepts and applied in a computational lab using both commercial computational software and a commercial seismic data processing system.

Prerequisite(s): Geophysics 517.

Geophysics 559 3 units; H(3-2)

Geophysical Interpretation
Analysis and integration of geophysical and geological data. Qualitative and quantitative interpretation. Industrial case studies.

Prerequisite(s): Geophysics 351 or 355; and 78 units (13.0 full-course equivalents).

Geophysics 565 3 units; H(3-3)
(formerly Geophysics 465)

Environmental Applications of Geophysics
Application of geophysical methods such as resistivity, electromagnetics, and ground penetrating radar to investigations of geological, geotechnical, hydrological, and environmental problems. Small-scale high resolution applications of other geophysical methods (seismic, gravity, magnetics).

Prerequisite(s): Mathematics 249 or 251 or 265 or 275 or 281 or Applied Mathematics 217 and 78 units (13.0 full-course equivalents).

Antirequisite(s): Credit for Geophysics 565 and either 365 or 465 will not be allowed.

Geophysics 599 3 units; H(3-3)

Contemporary Topics in Geophysics
Courses are offered in contemporary topics in areas such as seismology, gravity and magnetics, electrical and electromagnetic methods, exploration and environmental geophysics, and integrated geophysical methods.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Graduate students are urged to read the Geoscience Department section in the Graduate Studies calendar. Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599. Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geophysics 645 3 units; H(3-0)

Seismic Wave Propagation
Seismic body and surface waves, reflection, refraction, diffraction, anelasticity, anisotropy, ray methods, point and line source solutions to the equation of motion, finite-difference methods for seismic waves, additional topics depending on current research interests.

Prerequisite(s): Geophysics 551.

Geophysics 653 **3 units; H(3-0)**

Electromagnetic and Induced Polarization Topics
Topics in electromagnetic and induced polarization exploration as applied to the search for metallic minerals.

Geophysics 657 **3 units; H(3-0)**

Seismic Signal Analysis
Advanced methods of seismic data analysis in exploration and production geophysics. Topics include velocity analysis, polarization filtering, median filtering, migration, inversion and tomography.

Geophysics 659 **3 units; H(3-3/2)**

Practical Seismic Modelling, Migration, and Inversion
Concepts and techniques of seismic imaging (migration) are explored. Practical considerations such as algorithm characteristics and data geometry are emphasized; poststack and prestack migration and DMO methods are examined from the Kirchhoff, Fourier, and downward continuation perspectives.

Note: Some familiarity with seismic data and computer programming is assumed.

Geophysics 665 **3 units; H(3-0)**

Theoretical Seismology
Seismic ray theory, inverse theory, full-wave methods, matrix methods, numerical methods, additional topics depending on current research interests.

Prerequisite(s): Geophysics 551.

Geophysics 667 **3 units; H(3-3)**

Introduction to Microseismic Methods
Use of microseismic methods as surveillance technology during hydraulic-fracture treatment of tight reservoirs. Methods for acquiring, processing and interpreting microseismic data. Methods for picking events, determining hypocenter location and magnitude, and interpreting the stimulated rock volume.

Prerequisite(s): Consent of the Department.

Geophysics 669 **3 units; H(3-0)**

Global Seismology
An introduction to theory and practice of global seismology. Topics include: seismograph systems, global wave propagation, moment tensors, shear-wave splitting, surface waves, receiver functions, seismic tomography and teleseismic receiver functions.

Prerequisite(s): Admission to the graduate program in geophysics.

Geophysics 671 **3 units; H(3-0)**

Inverse Theory and Applications I
An introduction to the mathematical and numerical techniques of geophysical inversion. Topics include least squares, singular value decomposition, and Tikhonov regularization. Development of numerical codes to solve real inverse problems is stressed.

Prerequisite(s): Admission to the graduate program in geophysics.

Geophysics 673 **3 units; H(3-0)**

Inverse Theory and Applications II
Multidimensional real-world inverse problems, such as constrained seismic, gravity, or resistivity inversion. Fourier, maximum entropy, Bayesian approaches and iterative solution techniques such as Kaczmarz and conjugate gradient are covered.

Prerequisite(s): Consent of the instructor.

Geophysics 681 **3 units; H(3-0)**
(Geomatics Engineering 681)

Advanced Global Geophysics and Geodynamics
Elasticity, figure of the Earth, Earth structure and seismology, gravity and its temporal variations, isostasy, tides, Earth rotation and orientation, time, plate flexure, glacial rebound, continental drift, geodetic observation methods for geodynamics.

Geophysics 683 **3 units; H(3-0)**

Dynamics of the Earth
Fluid mechanics and Earth rheology, heat flow and mantle convection, magneto hydrodynamics and core dynamics, stresses, folding and diapirism, faulting and earthquake mechanism.

Geophysics 687 **3 units; H(3-0)**

Theory of Seismic Imaging
The theories of wave propagation in acoustic and elastic media are used to develop the major algorithms used in seismic imaging (migration). Green's theorem, Huygen's principle, Kirchhoff diffraction theory, raytracing, wavetracking, multidimensional Fourier analysis, and Radon transforms are explored.

Note: Elementary knowledge of vector calculus and partial differential equations is assumed.

Geophysics 695 **3 units; H(3-0)**

Research Topics and Tools
An introduction to seismic structural imaging and interpretation, seismic velocity anisotropy, and multicomponent seismology, including seismic survey design for PS converted waves. Discussion of software packages used for graduate research programs.

Prerequisite(s): Consent of the Department.

Geophysics 699 **3 units; H(3-3)**

Selected Topics in Geophysics
Courses are offered in specific topics in areas such as seismology, environmental geophysics, potential methods, integrated geophysical studies, and geodynamics.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geophysics 701 **3 units; H(0-6)**

Advanced Independent Study
A written report based on laboratory and field studies is required.

Note: Open only to graduate students in the Department of Geoscience.

Geophysics 703 **3 units; H(0-6)**

Readings in Geophysics
A written report based on a literature review is required.

Note: Open only to graduate students in the Department of Geoscience.

German GERM

Instruction offered by the Department of Linguistics, Languages, and Culture in the Faculty of Arts. Students are encouraged to consult the Department website (llc.ucalgary.ca/) for more details on course descriptions and titles of decimalized courses.

Notes:

German 200, 317, 357, 359, and 451 are given in English and no knowledge of German is required. These courses do not count as prerequisites to other senior German courses.

Course outcomes for German have been aligned with the descriptions found in the internationally recognized Common European Framework of Reference for Languages (CEFR) coe.int/t/dg4/Linguistic/CADRE_EN.asp. These CEFR designations enable easier transfer between institutions, both within Canada and abroad, and provide better evidence of language proficiency for employment purposes. The correlations with the CEFR given for each language course provide an orientation, but do not confer accreditation for a particular level. However, if they choose, students will be able to take an internationally recognized exam through the Language Research Centre as accreditation for the proficiency level they have achieved.

Junior Courses

German 200 **3 units; H(3-0)**

Made in Germany
An introduction to the study of German-language cultures through key historical and contemporary works.

Note: Taught in English.

German 202 **3 units; H(3-1T)**

German I
A comprehensive course for students with no prior knowledge of the language. Includes training in listening, speaking, reading and writing of German in its cultural context. Corresponds to level A1 of the Common European Framework of Reference.

Antirequisite(s): Credit for German 202 and any of 30, 31, 213 or 305 will not be allowed.

German 204 **3 units; H(3-1T)**

German II
A continuation of German 202. Corresponds to level A2.1 of the Common European Framework of Reference.

Prerequisite(s): German 202.

Senior Courses

German 305 **3 units; H(3-0)**

Reading German
An introduction to analytic reading strategies for the purpose of understanding the content of moderately difficult texts with diverse content and discourse styles. Designed for students with no knowledge of German, who wish to be able to understand German texts.

Antirequisite(s): Credit for German 305 and 202 will not be allowed.

Note: This is an online course. Taught in English.

German 317 **3 units; H(3-0)**

Topics in German Culture
Distinctive features of German culture within a historical and contemporary context.

317.01 German Icons

317.02 Narratives of German Nationhood

317.03 German Intellectual History

317.04 Sex, Gender and Culture

Note: Taught in English. This course may be repeated for credit where the course content is different, as indicated by a different decimal number for the course. May be repeated for a maximum credit of 6 units (1.0 full-course equivalent).

German 331 **3 units; H(3-1T)**

Continuing German I
A comprehensive course that includes training in listening, speaking, reading and writing of German in its cultural context. Development of increased sophistication in language production and cultural understanding. Corresponds to A2.2 of the Common European Framework of Reference.

Prerequisite(s): One of German 30 or 30-3Y, 204, 223, 302, or 303.

German 333 **3 units; H(3-1T)**

Continuing German II
A continuation of German 331. Corresponds to B1.1 of the Common European Framework of Reference.

Prerequisite(s): German 331.

German 349 **3 units; H(3-0)**

German Studies Research Methods
Introduction to research questions and research methods in German studies through case-study application.

Prerequisite(s): Consent of the Department.

Note: Taught in English. German 333 is recommended as preparation for this course.

German 353 **3 units; H(3-0)**

Structure of German
Development of a structural understanding of the German language through an introduction to linguistic analysis, including research questions and research methods in German linguistics.

Prerequisite(s): German 333.

German 357 **3 units; H(3-3)**

Topics in Film
German film from the perspectives of film theory and political and cultural history. May concentrate on a specific director, a period, or a genre in German film.

Note: Taught in English.

MAY BE REPEATED FOR CREDIT

German 359 **3 units; H(3-0)**

German Texts in Translation
Study of literary and cultural texts within the rich tradition of Germany's Dichter und Denker (poets and philosophers).

Note: Taught in English.

MAY BE REPEATED FOR CREDIT

German 369 **3 units; H(3-0)**

Telling Stories: Exploring German Literature
An introduction to historical and contemporary literary and cultural texts in German.

Prerequisite(s): German 349.

German 413 **3 units; H(3-0)**

Intermediate German: Speaking and Listening
Targeted focus on aural/oral communication skills in a variety of contexts and media. Corresponds to B1.2 of the Common European Framework of Reference.

Prerequisite(s): German 333.

German 415 **3 units; H(3-0)**

Intermediate German: Reading and Writing
Targeted focus on reading strategies, interpretive skills, and the production of a variety of texts. Corresponds to B1.2 of the Common European Framework of Reference.

Prerequisite(s): German 333.

German 451 **3 units; H(3-0)**

Cross-Cultural Explorations
Cross-cultural comparison of events, cultural patterns, historical periods, or social movements which find a parallel in more than one of the cultural traditions represented in the Department.

Note: Taught in English.

MAY BE REPEATED FOR CREDIT

German 467 **3 units; H(3-0)**

Advanced German Linguistics
In-depth exploration of topics in German linguistics.

467.01. Synchronic Linguistics

467.02. Diachronic Linguistics

467.03. Language Acquisition

Prerequisite(s): German 353.

German 469 **3 units; H(3-0)**

Culture Change: Concepts and Critique
469.01. Memory and Memorials

469.02. Counter Cultures

469.03. (Trans)Nationalism

469.04. Media and Intermediality

Prerequisite(s): Consent of the Department.

German 497 **3 units; H(3-0)**

Inter-Cultural Immersion Experience
Independent study course. Project with Inter-cultural theme, derived from an immersion experience at an advanced level, most likely abroad.

Prerequisite(s): Consent of the Department.

NOT INCLUDED IN GPA

German 501 **3 units; H(3-0)**

Advanced German
Students will increase their overall proficiency, enhance their intercultural communication competencies, and review key grammatical concepts. Corresponds to B2.1 of the Common European Framework of Reference.

Prerequisite(s): German 413 or 415.

German 503 **3 units; H(3-0)**

Senior Projects in Language
Students will integrate theory and practice in the use of German through a variety of class projects. Designed to expand and refine overall linguistic and intercultural competence. Corresponds to B2 of the Common European Framework of Reference.

Prerequisite(s): German 501.

MAY BE REPEATED FOR CREDIT

German 551 **3 units; H(3-0)**

Independent Study
Research project developed in consultation with and under supervision of instructor.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

German 561 **3 units; H(3-0)**

New Research Directions in German Studies
Centred on a professor's current research project, the course will engage senior students as members of a collaborative research team. Independent research, discussion, group presentations.

Prerequisite(s): 3 units (0.5 full-course equivalent) in German 469 and consent of the Department.

MAY BE REPEATED FOR CREDIT

German 591 **3 units; H(0-3T)**

Honours Project
The Honours project for Honours students in their final year.

Prerequisite(s): Consent of the Department.

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

German 627 **3 units; H(3S-0)**

Seminar in German Literature and Culture
Selected topics in literary history.

MAY BE REPEATED FOR CREDIT

German 629 **3 units; H(3S-0)**

Seminar in German Language and Linguistics
MAY BE REPEATED FOR CREDIT

German 631 **3 units; H(3S-0)**

Seminar in German Language Pedagogy
MAY BE REPEATED FOR CREDIT

German 696 **6 units; F(1-0)**

Bibliography, Research Methods and Grant Proposal Writing
Note: Required of all graduate students who have not had an equivalent course.

NOT INCLUDED IN GPA

German 699 **3 units; H(3-0)**

Conference Course
Meets the needs of individual students. It may include a general or specific linguistic topic; or the detailed study of an author, period, genre; or any literary problem not dealt with in the honours or graduate courses listed above.

MAY BE REPEATED FOR CREDIT

Greek GREK

Instruction offered by members of the Department of Classics and Religion in the Faculty of Arts.

Note: For courses on Greek Literature in translation, Greek History, Art, Archaeology, etc., see Greek and Roman Studies (GRST).

Note on Course Sequence and Prerequisites: The normal sequence is Greek 201, 203, 301, 303, 401 and/or 403, 551.

Junior Courses

Greek 201 **3 units; H(4-1T)**

Ancient Greek I
This course for beginners provides the first steps towards reading classical and New Testament Greek texts.

Greek 203 **3 units; H(4-1T)**

Ancient Greek II
Continuation of Greek 201.

Prerequisite(s): Greek 201.

Senior Courses

Greek 301 **3 units; H(3-0)**

Ancient Greek III
Completes the study of basic grammar, vocabulary and translation skills.

Prerequisite(s): Greek 203.

Greek 303 **3 units; H(3-0)**

Intermediate Readings in Classical and New Testament Greek
Prerequisite(s): Greek 301.

Greek 401 **3 units; H(3-0)**

Readings in Greek Prose
Readings will normally be selected according to genres, such as Historiography, Oratory, Philosophic and Didactic Prose, and the Novel.

Prerequisite(s): Greek 303.

MAY BE REPEATED FOR CREDIT

Greek 403 **3 units; H(3-0)**

Readings in Greek Poetry
Readings will normally be selected according to genres, such as Epic, Tragedy, Comedy and Lyric.

Prerequisite(s): Greek 303.

MAY BE REPEATED FOR CREDIT

Greek 551 **3 units; H(0-2T)**

Directed Studies in Greek
Readings may be selected from any genre of Greek text at an advanced level.

Prerequisite(s): Consent of the Department.

Note: Students in Greek and Roman Studies or Ancient and Medieval History are encouraged to pursue areas such as paleography, epigraphy, and Christian texts.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Greek 601 **3 units; H(3S-0)**

Graduate Seminar
MAY BE REPEATED FOR CREDIT

Greek 602 **3 units; H(4-1)**

Introductory Language Class for Graduate Students
Introduction to grammar, vocabulary and translation skills.

MAY BE REPEATED FOR CREDIT

Greek 604 **3 units; H(3-0)**

Intermediate Language Class for Graduate Students
Consolidation of grammar, vocabulary and translation skills.

MAY BE REPEATED FOR CREDIT

Greek 607 **1.5 units; Q(0-1T)**

Directed Studies
MAY BE REPEATED FOR CREDIT

Greek and Roman Studies GRST

Instruction offered by members of the Department of Classics and Religion in the Faculty of Arts.

For courses in the ancient Greek and Latin languages see listings under Greek and Latin.

Note: Undergraduate courses under this heading do not require any knowledge of Greek or Latin. Courses at both the 200-level (designed for first-year students) and 300-level are survey courses with no prerequisites. The research topics courses Greek and Roman Studies 413-457 (except Greek and Roman Studies 431) do not have specific prerequisites, but students are strongly advised to have taken at least two 300-level Greek and Roman Studies courses with grades of at least "C-" before enrolling in them.

Junior Courses

Greek and Roman Studies 205 **3 units; H(3-0)**

Introduction to Greece and Rome
A historical survey from the eighth century BCE to the fourth century CE.

Greek and Roman Studies 209 **3 units; H(3-0)**

Classical Mythology and Literature
An introduction to Greek and Roman myths as presented in classical literature and art, and to their cultural context.

Greek and Roman Studies 211 **3 units; H(1-2)**

Technical Terms of Medicine and the Life Sciences
The Greek and Latin elements of modern medical and life-sciences terminology, with a brief introduction to their history and cultural background.

Senior Courses

Greek and Roman Studies 305 **3 units; H(3-0)**
(Religious Studies 305)

Greek Religion
A survey of religious beliefs and practices in the pre-Christian Greek world.

Prerequisite(s): One of Greek and Roman Studies 205, 209, Religious Studies 201, 205, or 273.

Greek and Roman Studies 306 **3 units; H(3-0)**

Roman Religion
A survey of religious beliefs and practices in the pre-Christian Roman world.

Prerequisite(s): One of Greek and Roman Studies 205, 209, Religious Studies 201, 205, or 273.

Greek and Roman Studies 309 **3 units; H(3-0)**

Comparative Mythology
An examination of Greek and Roman myths in comparison with myths of other cultures and societies.

Greek and Roman Studies 311 **3 units; H(3-0)**

Sport in Ancient Greece and Rome
A survey of sports practised in Greece and Rome and the role of sport as a cultural, political and historical phenomenon.

Greek and Roman Studies 313 **3 units; H(3-0)**

The Ancient Novel and Its Predecessors
A survey of ancient Greek and Roman 'novels' or romances, with reference to their roots in epic poetry and New Comedy.

Greek and Roman Studies 315 **3 units; H(3-0)**

Women and the Family in the Greek and Roman World
A survey of the lives, social roles and representations of women based on documentary evidence, literature and art. Emphases may vary from term to term.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 321 **3 units; H(3-0)**

Ancient Technology
A survey of major technologies in antiquity (metallurgy, agriculture, hydraulics, pottery, textiles, transportation, writing, construction) with special emphasis on the technological achievements of the Bronze Age and the cultures of Greece and Rome.

Greek and Roman Studies 325 **3 units; H(3-0)**

Greek Art and Architecture
A survey of Greek art and architecture from the Bronze Age to the Hellenistic period.

Greek and Roman Studies 327 **3 units; H(3-0)**

Roman Art and Architecture
A survey of Roman art and architecture from the Etruscans to the beginning of the Christian Empire.

Greek and Roman Studies 335 **3 units; H(3-0)**

The Ancient Near East to Alexander the Great
History of the Near East from the tenth to the fourth century BCE.

Greek and Roman Studies 337 **3 units; H(3-0)**

Early Greece
Early Greece from the late Bronze Age to the Persian Wars.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 339 **3 units; H(3-0)**

History of Classical Greece
History of the Greek world from the Persian Wars to the conquests of Alexander the Great.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 341 3 units; H(3-0)

History of Rome's Expansion into the Mediterranean to 30 BCE
The expansion of Rome into an empire to the time of Augustus.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 345 3 units; H(3-0)

Rome: The Late Republic and Early Empire
History of Rome from 133 BCE to 180 CE.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 347 3 units; H(3-0)

Late Roman Antiquity
History of the Roman and Byzantine world from 180 to 565 CE.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 355 3 units; H(3-0)

Warriors and Lovers: Greek Literature in Translation
An introduction to Greek literature from Homer to the Hellenistic Period.

Greek and Roman Studies 357 3 units; H(3-0)

Myths, Slaves and Heroes: Roman Literature in Translation
An introduction to Roman literature from its beginnings to the second century CE.

Greek and Roman Studies 413 3 units; H(3-0)

Topics in Early and Classical Greek History
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 415 3 units; H(3-0)

Topics in Hellenistic and Roman Republican History
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 417 3 units; H(3-0)

Topics in the History of the Roman Empire
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 419 3 units; H(3-0)

Topics in Late Antiquity
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 421 3 units; H(3-0)

Topics in Greek and Roman Political and Military History
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 423 3 units; H(3-0)

Topics in Greek and Roman Social and Economic History
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 425 3 units; H(3-0)

Greeks, Romans and Other Cultures: Selected Topics
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 431 3 units; H(3-0)

Studies in Ancient Myths
Studies in the nature and functions of myth in ancient Greek and Roman culture and society. Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

Prerequisite(s): Greek and Roman Studies 209.

Greek and Roman Studies 433 3 units; H(3-0)

Topics in Greek and Roman Religion, Intellectual and Cultural History
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 445 3 units; H(3-0)

Topics in Greek Art and Archaeology
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 447 3 units; H(3-0)

Topics in Roman Art and Archaeology
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 455 3 units; H(3-0)

Topics in Greek Literature in Translation
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 457 3 units; H(3-0)

Topics in Latin Literature in Translation
Topics will reflect developments in current research, will vary from term to term, and will be announced in advance.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 459 3 units; H(2-3)

Topics in Ancient Greece and Rome on Film
The reception of ancient Greek and Roman mythology and history through selected films.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 483 3 units; H(0-2)

Practicum
Provides students with program-related experiential learning through practical activities such as teaching, editing, publishing, translating, performances, exhibitions, museum work, conferences, information and website development, and campus, school and community programs. Projects must be designed in consultation with a departmental advisor. A written report and oral presentation are normally required.

Prerequisite(s): Consent of the Department.

NOT INCLUDED IN GPA

Greek and Roman Studies 491 3 units; H(0-6)

Field Work
Provides credit, when transfer credit is not available of program-related study or field work in Europe or the Mediterranean area. Preliminary readings and a substantial report are normally required.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 494 6 units; F(0-12)

Field Work
Similar to Greek and Roman Studies 491 but provides 6 units (1.0 full-course equivalent) of credit for appropriate projects.

Prerequisite(s): Consent of the Department.

NOT INCLUDED IN GPA

Greek and Roman Studies 499 3 units; H(3-0)

Topics in Ancient and Medieval Historiography
Topics will include the analyses of the methods, sources, and key themes of major ancient and medieval historians.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 501 3 units; H(3-0)

Majors' Special Topic
Interdisciplinary course to link knowledge and skills learned throughout the student's undergraduate career.

Prerequisite(s): Admission to one of Greek and Roman Studies or Ancient and Medieval History majors and completion of 90 units (15 full-course equivalents) and consent of the Department.

Greek and Roman Studies 504 6 units; F(3-0)
(formerly Greek and Roman Studies 503)

Honours Thesis
The Honours essay for Honours students in their fourth year.

Prerequisite(s): Admission to the Honours programs in Greek and Roman Studies or Ancient and Medieval History and completion of 90 units and consent of the Department.

Greek and Roman Studies 525 3 units; H(3S-0)

Research Seminar
Research topics in Greek and Roman history, literature, art, and archaeology. Seminar discussions will require a high level of student participation.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 551 3 units; H(0-2T)

Directed Research
Qualified students will undertake supervised research projects individually or in small groups.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Greek and Roman Studies 601 3 units; H(3S-0)

Graduate Seminar
MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 603 3 units; H(1S-0)

Research and Professional Training
NOT INCLUDED IN GPA

Greek and Roman Studies 651 3 units; H(0-2T)

Directed Studies
Qualified students will undertake supervised research projects individually or in small groups.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Health and Society HSOC

Instruction offered by members of the Cumming School of Medicine.

Contact - BHSc Office

Junior Course

Health and Society 201 3 units; H(3-0)

Introduction to Health and Society
Introduction to public health, emphasizing the contributions of social research from several disciplinary traditions (anthropology, economics, epidemiology, geography, political science, psychology, and sociology) Students practice and refine several skill sets, including: library research, public speaking, teamwork, leadership and academic writing.

Senior Courses

Health and Society 301 3 units; H(3-0)

Determinants of Health
A broad-based, interdisciplinary overview of models of the determinants of health. Includes an analysis of evidence of the relative influence of environmental factors, health services, lifestyles and health behaviours, social and economic factors, biological predispositions, and the mechanisms involved in the societal uptake of various conceptions.

Prerequisite(s): Health and Society 201 or consent of the instructor.

Health and Society 311 3 units; H(3-0)

Health Services and Health Systems
Introduction to the Canadian health system, the health policy process, institutions and providers in the health system, health care insurance, financing and delivery of health care, population and public health, a systems approach to health in a national and international perspective

Prerequisite(s): Health and Society 201 or consent of the instructor.

Health and Society 401 3 units; H(3-0)

Foundations of Social Science Method
An examination of some philosophical principles underlying and debates involving methodology in the social sciences. Consideration will be given to features both common to the social sciences as well as to those which distinguish them. Where appropriate, applications to health phenomena will be emphasized.

Prerequisite(s): Health and Society 201 and third year or higher in the BHSc Honours or Health and Society minor program or consent of the instructor.

Health and Society 408 6 units; F(6-0)

Health Research Methods and Research field practicum
An introduction to the research methods utilized in the Health Sciences. Students will begin to develop the knowledge and skills necessary to conduct research in the Health and Society field. The importance of research design, qualitative, quantitative and mixed methods and the theoretical constructs that inform these approaches will be emphasized.

Prerequisite(s): Medical Science 308 and admission to the BHSc Honours program.

Health and Society 591 3 units; H(3S-0)

Advanced Seminar in Health and Society
An advanced seminar involving critical analysis of contemporary health issues. Topics vary from year-to-year, but are always drawn from the current academic literature, from the public policy arena, and/or from the popular media.

Prerequisite(s): Health and Society 401 and registration in the BHSc Honours Health and Society major.

History HTST

Instruction offered by members of the Department of History in the Faculty of Arts.

History Table for Requirements 2 and 3

For use in selecting courses to fulfill Canadian History and History before 1850 requirements.

Canadian History	History Before 1850
211	203
213	204
337	211
340	303
341	305
345	319
347	321
349	326
351	327
357	336
431	359
435	365
436	406
437	425
438	426
439	464
442	473
443	504
447	509
450	565
451	
501*	
520	
521	
523	
525	
526	
527	
528	
529	
531	
551	

** May be counted with the approval of the Program Co-ordinator when the topic is appropriate.*

Junior Courses

History 200 3 units; H(3-0)

Events and Ideas that Shook the World
Designed for non-history majors, this course introduces students to the historical craft through a series of short lecture sequences that focus on specific events, ideas, and individuals that changed the course of world history.

Note: May not count towards the field for Majors, Honours or Minors in History.

History 201 3 units; H(3-0)

The History of Europe
Selected topics may include formation and breakdown of political structures: cultural, social, and technological continuity and change; development of religious and secular belief systems; interactions among cultures. Course content will vary each session. Please consult the History Department for more specific information.

History 202 3 units; H(3-0)

An Introduction to Military History
Significant events and themes in military history.

History 203 3 units; H(3-0)
(formerly History 301)

The World to 1500
The development and rise of civilizations, their divergent and interacting patterns of belief, social and political organization and material and cultural life.

History 204 3 units; H(3-0)

The World, 1500-1800
The political, economic, cultural, ecological and social connections among world regions.

Antirequisite(s): Credit for History 204 and 205 will not be allowed.

History 209 3 units; H(3-0)

The History of China
A survey of thought in China from the cultural heroes to the present, with emphasis on philosophy, religion, and ideology. Topics covered include Shang religion, Confucianism, Taoism, Mohism, minor schools of thought, Legalism, Buddhism, Neo-Confucianism, Qing textual studies, republican ideologies, nationalism, Marxism-Leninism Mao Zedong Thought, and late twentieth-century reformist movements.

History 211 3 units; H(3-0)

Canada: Origins to 1867
An introduction to the dynamic themes in early Canadian history. Special attention will be devoted to social, economic, and political development, White-Aboriginal relations and the settlement of the Maritimes and the Canadas, and the opening of the West.

History 213 **3 units; H(3-0)**

Canada Since 1867
Themes in the development of the Canadian nation from Confederation to the present, with particular attention to federal-provincial relations, economic development, social movements, and western political protest.

Senior Courses

History 300 **3 units; H(3-0)**

The Practice of History
Provides a grounding in the methods and practice of history.

Note: This is a compulsory course for History majors and prerequisite for History 496 and all 500-level seminars.

History 303 **3 units; H(3-0)**

Great Explorations
The concept of exploration from the time of Columbus to the space voyages, based on the reading of primary sources. Topics include the idea of conquest, views of different races and religions, and myths and realities of explorers and discovered lands.

History 305 **3 units; H(3-0)**

Slavery in the Americas
History of the enslavement of Africans and their descendants in the New World from 1492 to 1888. Themes may include the slave trade, labor, culture and religion, resistance and rebellion, abolition, and slavery's legacy.

Antirequisite(s): Credit for History 305 and 207 will not be allowed.

History 307 **3 units; H(3-0)**

The Contemporary World
The contemporary world from the nineteenth century era of industrialism and empire, through to twentieth century struggles of underdeveloped countries for independence. Stress will be laid on growing global interdependency and the rise and the erosion of western cultural, economic, and political hegemony.

History 308 **3 units; H(3-0)**

Gender History
A global history of the construction of gender and sexual identities. Examines how changing ideas about what it means to be male and female have influenced family structures, sexual mores, work life, military ideals, politics and culture.

History 317 **3 units; H(3-0)**

East Asia from 1800
The modern histories of China, Japan and Korea beginning with the Mid-Qing dynasty in China and the Late Tokugawa period in Japan.

History 319 **3 units; H(3-0)**

Early Medieval Europe, 410-1076
The sack of Rome to the eve of the Investiture Controversy. The economic, social and institutional features of Western Europe, including the origins and rise of the Church, monasticism, barbarian kingdoms, feudalism and the agrarian economy.

History 321 **3 units; H(3-0)**

High and Late Medieval Europe, 1076-1418
Western Europe from the emergence of national states to the end of the Great Schism. The evolution of the economic, social, religious and cultural structures of Medieval Europe: the revival of agrarian, commercial and urban economies, the development of religious divisions, and the rise of church and state powers.

History 326 **3 units; H(3-0)**

Europe in the Age of the Renaissance and Reformation, 1400-1559
Political, social, cultural, intellectual and religious developments that transformed Europe at the end of the middle ages; roots of religious schism and its impact on politics, diplomacy and society.

Antirequisite(s): Credit for History 326 and either 323 or 325 will not be allowed.

History 327 **3 units; H(3-0)**

Europe in the Era of Religious War, 1559-1715
The clash of Protestant and Catholic forces, the eventual decline in religious passions, and the general crisis of the seventeenth century.

History 333 **3 units; H(3-0)**

The Age of Totalitarianism
Europe from 1900 to the Cold War. Emphasis will be placed on totalitarian regimes in Italy, Germany, and the Soviet Union; war and society in the two world wars; the Holocaust; and the Cold War.

History 336 **3 units; H(3-0)**

Britain to 1714
Origins to the early eighteenth century, with an emphasis on culture and society, religion and learning, constitutional and political developments, and empire and global relations.

History 337 **3 units; H(3-0)**

Twentieth-Century Canada
Explores major themes in the emergence of modern Canada, with emphasis on the rise of a national consciousness, military and diplomatic involvements, the role of the state, socio-economic developments and national unity.

History 338 **3 units; H(3-0)**

Modern Britain 1714 to Present
The Industrial Revolution; nationalism and imperialism; the rise of the middle and working classes; the social welfare state; emergence of modern British society, economy, politics, and constitution.

History 340 **3 units; H(3-0)**

Ethnicity, Race, and Immigration in Canada
Examines developments in and challenges to diversity in Canada in the nineteenth and twentieth centuries with emphasis on ethnic and immigrant cultures in rural communities and urban centres.

History 341 **3 units; H(3-0)**

History of Popular Culture in Canada, 1850-Present
Selected themes in the historical development of popular culture in Canada. Topics include: leisure and recreation, sports and games, the arts, popular entertainment, travel and tourism, national heroes and icons, consumerism and the mass media.

Antirequisite(s): Credit for History 341 and 449 will not be allowed.

History 345 **3 units; H(3-0)**

Canadian Native History
Aboriginal Canada, from the beginnings of contact with Europeans in the sixteenth century, to the present, with particular emphasis on Native-Newcomer relations.

History 347 **3 units; H(3-0)**

Western Canada
An exploration of Western Canadian history, including themes such as: the native peoples, European exploration, settlement, rural and urban society, social and political reform, the New West, and culture.

History 349 **3 units; H(3-0)**

Canadian Military History
Survey of the history of the Canadian military in peace and war from 1867 to the present. Emphasis will be placed on Canada's role in World War I and World War II and on the development of the Canadian military in the Cold War era.

History 351 **3 units; H(3-0)**

A History of Canadian Politics
The historical development of Canadian politics and political culture since Confederation. Major themes will include the emergence and changing role of parties, the impact of federalism, political insurgency and reform, and leadership.

History 354 **3 units; H(3-0)**

Landscape, Settlement and Cities in Global History
History of the making of urban, landscapes in a global context. Topics may include the development of economic centres, urban technological and infrastructural innovations, and the complex relationships developing between the metropolis and its rural and wild hinterlands.

History 357 **3 units; H(3-0)**

Wild West/Mild West?: Comparative History of the U.S. and Canadian Wests
The similarities and differences in the histories of the Canadian and U.S. Wests from the pre-colonial periods to the present. Topics may include the place of frontier and the West in national historical narratives, myths, and imaginations; aboriginal peoples; immigration and settlement; land policy and land use; and the social relationships and economies that characterize the U.S. and Canadian Wests.

History 359 **3 units; H(3-0)**

The United States to 1877
A history of the United States from colonial settlement through the era of Reconstruction.

History 361 **3 units; H(3-0)**

The United States since 1877
A history of the American people since the era of Reconstruction.

History 365 **3 units; H(3-0)**

Latin America before Independence
The history of colonial Latin America with particular reference to political, social and economic themes such as race relations, imperial rivalries and the struggle for national independence.

History 367 **3 units; H(3-0)**

Latin America since Independence
A history of the Latin American nations since independence with special attention devoted to political change, economic dependency and modernization, social and economic revolution, and inter-American relations.

History 372 **3 units; H(3-0)**

Ways of Knowing: Science, Technology, and Medicine
A transnational examination of the relationships among these traditions in historical and cultural context. Topics may include: the scientific revolution; the early modern period; nineteenth-century technology and medicine; the emergence of the modern life sciences and neurosciences; changing scientific paradigms and research traditions.

Antirequisite(s): Credit for History 372 and either 371 and 373 will not be allowed.

History 381 **3 units; H(3-0)**

Military History: The Era of Revolutionary War and Total War
Significant events and themes in military history from the early modern period to the end of the Second World War.

History 383 **3 units; H(3-0)**

Military History: The Cold War Era and Beyond
Significant events and themes in military history from the Cold War through to recent post-Cold War history.

History 395 **3 units; H(3-0)**

History of Energy: From Fire to Fossil Fuels and Beyond
Transnational examination of the sources and uses of energy through history and their social, political, economic, and environmental impacts.

History 397 **3 units; H(3-0)**

Topics in World History
397.01 African History

397.02 History of the Middle East

397.03 South Asian History

Antirequisite(s): Students may not have credit for History 397.01 and 309; History 397.02 and 390; and History 397.03 and 403.

History 404 **3 units; H(3-0)**
(formerly History 385)

The History of Taiwan
Survey of Taiwan history from ca. 1550 to the present, emphasizing pre-Chinese aboriginal history, migration to the island, government, society, intercommunal relations, Taiwan's international status, and recent democratization.

History 406 **3 units; H(3-0)**

The Mongol World Empire
The rise of Chinggis Khaghan (Genghis Khan) in early thirteenth-century Eurasia, the growth and conquests of the Mongol world empire, and the individual khanates of Yuan dynasty China, the Golden Horde in Russia, the Il Khanate in the Middle East, and the Chagadai Khanate in Inner Asia.

History 412 **3 units; H(3-0)**

Russia and the Soviet Union
A short introduction to pre-nineteenth-century Russian history and a survey of the history of Russia and the Soviet Union in the nineteenth and twentieth centuries, finishing with a brief examination of post-Soviet Russia.

Prerequisite(s): One 300 level History course or Russian 317.

Antirequisite(s): Credit for History 412 and 411.02 will not be allowed.

History 413 **3 units; H(3-0)**

Modern Germany
German political, social, and cultural history from the late nineteenth century to the present. Topics will include unification, both world wars, Nazism, the Holocaust, the division of Germany, society and politics in the Cold War, and reunification.

Antirequisite(s): Credit for History 413 and 413.02 will not be allowed.

History 425 **3 units; H(3-0)**

History of the Atlantic World
The history of the Atlantic Ocean world as a zone of contact, conflict, and co-operation between and among Europeans, indigenous peoples of the Americas, and Africans, circa 1450-1800.

History 426 **3 units; H(3-0)**

The European Reformations of the Sixteenth Century
The origins, course, and impact of the religious reformations (Protestant and Catholic) of the sixteenth century, including changes to institutional structures, theology, and popular belief.

History 427 **3 units; H(3-0)**

Ideas and Events that Shaped Modern Europe
Topics will vary to address major ideas and events that helped to shape modern Europe.

History 431 **3 units; H(3-0)**

Canada During the World Wars
The nature, course and impact of Canada's involvement in the two world wars, with emphasis on home front developments.

History 435 **3 units; H(3-0)**

Prophets, Priests and Prodigals: Selected Topics in Canadian Religious History
A historical analysis of the pluralistic character of Canadian religions. Themes will include missions, native religions, awakenings, revivalism and social reform, fundamentalism and modernism, secularization and belief.

History 436 **3 units; H(3-0)**

History of the University in Canada and the Western World
The development, ideas, and meanings of the university in Canada since the mid-nineteenth century. The rise of Canadian universities will be contextualized within the larger history of higher education institutions in the western world over the past one-thousand years.

History 437 **3 units; H(3-0)**

Canadian Environmental History
Historical development of Canadian attitudes towards nature, from the First Nations and the first European settlers to the present day.

History 438 **3 units; H(3-0)**
(formerly History 343)

History of Women in Canadian Society
Topics may include the role of women in the economy, politics, social reform, the law, health care, the domestic sphere, life course experiences, and culture.

History 439 **3 units; H(3-0)**

The Canadian West
Thematic treatment of topics in Western Canadian history.

Antirequisite(s): Credit for History 439 and 441 will not be allowed.

MAY BE REPEATED FOR CREDIT

History 442 **3 units; H(3-0)**
(formerly History 339)

Activism and Protest in Canada, 1867-Present
Examines cultures, ideas, and practices of activism and protest since Confederation. Topics include historical forms of political, ethnic, gender, religious, legal, and class-based meanings of equality and social justice.

History 443 **3 units; H(3-0)**
(formerly Canadian Studies 419)

The Métis People of Canada
An interdisciplinary study of the Métis people of Canada, with special emphasis on the historical, social, economic, and political factors influencing their emergence and continued survival as a distinct indigenous group in Canada.

History 447 **3 units; H(3-0)**
(formerly History 352)

Northern Horizons: Subarctic and Arctic Canadian History
Historical development of the region from the beginnings of European exploration to the present day. Themes include: the indigenous peoples, Arctic exploration, Canadian sovereignty, and the politics of northern development.

History 450 **3 units; H(3-0)**

History of Social Policy in Canada
A historical analysis of the development of social policy in Canada from the colonial period to the present. Themes may include the relationship between citizens and government, changing perceptions on the role of the state, grassroots demands for government intervention, and the relationship between private and public programs.

History 451 **3 units; H(3-0)**

Intellectual Roots of Modern Canada
Themes in Canadian intellectual history, including various expressions of nationalism, and the perception of English and French Canadian intellectuals and social reformers of the nature and impact of an urban, industrial and technological society.

History 458 **3 units; H(3-0)**

The United States in the Era of Depression and WWII, 1900 to 1945
The history of the United States from the dawn of the twentieth century through World War II, a turbulent period of wars and economic depression at the end of which the U.S. had emerged as a global superpower. Major themes include the rise of liberal reform; the experience of the U.S. in two world wars; the interplay of race, class, and gender in shaping American identity; and the economics of boom and bust culminating in the Great Depression and wartime boom of the 1940s.

History 459 **3 units; H(3-0)**

Topics in U.S. Social History
Topics vary from year to year and may include gender, class, race and ethnicity, slavery, labour, and social movements.

MAY BE REPEATED FOR CREDIT

History 460 **3 units; H(3-0)**

The United States Civil War Era
The political, economic and social history of the United States in the decades leading up to the Civil War, the military conflict itself and the aftermath of war.

History 461 **3 units; H(3-0)**

From the Pueblo Uprising to Wounded Knee: A History of American-Indian Conflicts
Military and political clashes between tribal groups, colonial governments, and the U.S. government from the late 1400s to the late twentieth century, focusing on causal factors and eventual sociopolitical consequences.

History 462 **3 units; H(3-0)**

Topics in United States Political History
Aspects of the history of American politics from the Revolution to the twentieth century. Emphasis on the process of governing; elections and party politics; legal and constitutional affairs.

History 463 **3 units; H(3-0)**

The United States Since 1945
The political, social, economic, and cultural dimensions of the United States from 1945 to the present. Major themes include the role of U.S. as a global superpower during the Cold War and after; the contest between liberalism and conservatism in American politics; the social movements of the 1960s and 1970s and their lasting impact; suburbanization and consumer culture; and the transition to a post-industrial economy.

History 464 **3 units; H(3-0)**

From Colonies to Nation: Making the United States
Explores the creation of the United States from its colonial origins through the Early National Period. Topics may include the political, military, diplomatic, legal, cultural and socio-economic challenges faced by the new nation.

History 465 **3 units; H(3-0)**

The U.S. South
Thematic consideration of the formation of regional identity, the nature of the Old South, secession and the Civil War, the emergence of the New South and Sun Belt, the Civil Rights Movement, and the role of the South in the modern United States.

Antirequisite(s): Credit for History 465 and 465.03 will not be allowed.

History 467 **3 units; H(3-0)**

Mexican History
Themes of Mexican history from the founding of Spain's most important colony, New Spain, to the present.

Antirequisite(s): Credit for History 467 and 467.02 will not be allowed.

History 471 **3 units; H(3-0)**

The Military in Latin America
The history of warfare and the armed forces in Latin America from colonial times to the present. Emphasis upon modern wars, militarism, the rise of caudillos, and the impact of the military on society.

History 472 **3 units; H(3-0)**

Latin American Revolutions
Thematic treatment of social revolutions in twentieth-century Latin America.

History 473 **3 units; H(3-0)**

History of Crime and Criminal Justice in England
Crime and the development of the criminal courts and jurisdictions, the police, punishments, and correctional institutions, from medieval to modern times. Attention will be given to the relationship of criminality to moral attitudes and socio-economic conditions, and to the historic role of crime and punishment in local communities, society and the state.

History 476 **3 units; H(3-0)**
(formerly known as History 477)

A Cultural History of Biomedical Sciences
Explores changing concepts about life, biology, and medicine from the European Renaissance to the twentieth century. Topics may include the rise of natural history, genetics, molecular biology, and neuroscience.

History 483 **3 units; H(3-0)**

World War I
An examination of the nature and course of the First World War (1914-1918), with an emphasis on the Western Front. Topics will include the historiography of the war, strategy and tactics, the impact of technology, and the effect of the war on the nations involved.

History 485 **3 units; H(3-0)**

World War II
The nature, course and short-term results up to 1950 of the Second World War in its global dimensions. The political as well as the military side of the Allied/Axis conflict will be studied.

History 486 **3 units; H(3-0)**

History of Air Power
An examination of the nature and development of air power across the world. Topics may include: technology; tactics; doctrine; the relationship between air power, weapons of mass destruction and precise attacks; the limits to air power and its role in war, peace, and deterrence.

History 487 **3 units; H(3-0)**

Brazilian History since 1500
Economic development, political institutions, social and cultural trends, and the interaction between men and women and the environment.

History 488 **3 units; H(3-0)**

Great Britain as a Great Power, 1690 - 1970
A study of British military, diplomatic and imperial history between 1690 and 1970, with a focus on the roots of Britain's power.

History 489 **3 units; H(3-0)**

Espionage and the State, 500 BCE - 1939
The rise of modern intelligence services in the West. Changes in the role, importance and technology of intelligence will be assessed. The contribution of intelligence to political and military strategy in selected conflicts will be examined.

History 490 **3 units; H(3-0)**

Espionage and the State, 1939 to the Present
Intelligence during the Second World War, the Cold War, and afterward. Changes in the role, importance and technology of attention will be assessed. The contribution of intelligence to political systems, international relations and military operations will be assessed.

Antirequisite(s): Credit for History 490 and 489.02 will not be allowed.

History 491 **3 units; H(3-0)**

Diplomatic History
A history of international relations and of the foreign policies of states in Europe and the world between the French Revolutionary Wars and the First World War. A history of international relations and of the foreign policies of states in Europe and the world between the end of the First World War and the end of the Cold War.

491.01. Diplomatic History, 1793-1918

491.02. Diplomatic History, 1919-1989

History 493 **3 units; H(3-0)**

Special Topics in History
The topic or topics for a given session will be announced in advance and will vary from year to year.

MAY BE REPEATED FOR CREDIT

History 494 **3 units; H(3-0)**

International History of Energy
Twentieth-century history of energy in an international context. Topics may include international relations and political economy focusing on governments, international institutions, and multinational corporations and the role of energy in international conflict and co-operation.

History 495 **3 units; H(2-3)**

Film and History
Film as a historical document, in particular as a source of social and intellectual history. Topics include: the role of film at moments of decisive historical change; the content and dissemination of political ideologies and social values; film as a source of propaganda; changing attitudes to minority groups; preservation of historical detail.

History 496 **3 units; H(3S-0)**
(formerly History 498)

Historical Methods and Philosophies of History
A seminar for Honours students on the interrelationship between the philosophies of History and historical methodology.

Prerequisite(s): History 300 and admission to Honours degree program.

500-Level Courses

Note: Preference in enrolment will be given to Majors in History, Ancient and Medieval History Majors, and graduate students in History.

History 501 **3 units; H(3S-0)**

Gender and Sexuality in History
An examination of gender theory and history with an emphasis on issues of sexuality. Topics and geographic concentrations will vary.

Prerequisite(s): History 300.

Antirequisite(s): Credit for History 501 and either 507 or 533 will not be allowed.

History 504 **3 units; H(3S-0)**

Britain and the Wider World, 1500-1800
Topics in British imperial and global history.

Prerequisite(s): History 300.

History 508 **3 units; H(3S-0)**

Topics in Twentieth-Century German History
Topics may include: thematic explorations and/or comparisons of dictatorial regimes (Nazi Germany and the German Democratic Republic); the history of the GDR; the two Germanies during the Cold War; memory and memorialization in popular culture; the contested formation of a multicultural society; and social protest in the post-WWII period.

For further information on specific topics to be offered in any year, consult the History Department.

Prerequisite(s): History 300.

History 509 **3 units; H(3S-0)**

Religion, Politics, and Culture in Early Modern Europe

Topics may include the nature of late medieval religion, the social impact of the Reformations, religious violence and co-existence, and the nature and practice of royal absolutism.

Prerequisite(s): History 300 and 323 or 325, 326 or 327.

MAY BE REPEATED FOR CREDIT

History 517 **3 units; H(3S-0)**

Social and Political History of Modern Britain

Topics in social, cultural and political history in early modern and modern times: e.g., the rise of the gentry and the middle class, working class identity, radical ideology and two-party politics.

Prerequisite(s): History 300.

History 520 **3 units; H(3S-0)**

Canada and the First World War

Discussion topics will focus on the major themes in Canada's Great War military experience, including the Canadian Expeditionary Force's recruitment and training, leadership, tactical doctrine, and integration within the British Expeditionary Force, as well as developments in civil-military relations, conscription politics and the country's postwar military legacy.

Prerequisite(s): History 300.

History 521 **3 units; H(3S-0)**

Canadian Biography

A thematic approach to Canadian personalities, emphasizing the biographer's method and changing interpretations of major Canadian figures, e.g., the prime ministers, prominent women, radicals, prophets, scientists, explorers, entrepreneurs, journalists and artists.

Prerequisite(s): History 300.

History 523 **3 units; H(3S-0)**

Topics in Alberta History

Selected topics in Alberta history with emphasis upon the use of local archival sources.

Prerequisite(s): History 300.

MAY BE REPEATED FOR CREDIT

History 525 **3 units; H(3S-0)**

Topics in Canadian Intellectual History

Ideas of Canadian political, economic, and cultural theorists and social reformers in the late nineteenth and twentieth centuries.

Prerequisite(s): History 300.

MAY BE REPEATED FOR CREDIT

History 526 **3 units; H(3S-0)**

The Canadian Military in the Second World War

Through examination of topics such as leadership and adapting to warfare, this course will examine the Canadian military's ability to cope with the harsh realities of war. Emphasis will be placed on the political parameters imposed by the Canadian government on the military, the quality of Canadian leadership, and the "fit" between British forms of military organization and the fighting quality of Canadian soldiers, sailors and aircrew.

Prerequisite(s): History 300 and 349 or 431.

History 527 **3 units; H(3S-0)**

History of Canadian Foreign and Defence Policy from 1919 to the Cold War Era

Selected topics in Canadian foreign policy and defence policy from the end of World War I to the 1980's.

Prerequisite(s): History 300 and one course in Canadian History.

History 528 **3 units; H(3S-0)**

Exchange, Trade, and Cultural Encounter in North America

The history of cross-cultural contact in North America from the late sixteenth through nineteenth centuries, examining cultures, economies, trading institutions and views of New and Old World people.

Prerequisite(s): History 300.

Antirequisite(s): Credit for History 528 and either 593.10 or 593.18 will not be allowed.

History 529 **3 units; H(3S-0)**

Topics in Native History

A history of the Aboriginal peoples of Canada: the First Nations, Inuit and Métis.

Prerequisite(s): History 300.

MAY BE REPEATED FOR CREDIT

History 531 **3 units; H(3S-0)**

Canadian Historiography

Major schools of historical writing in Canada: imperial, continental and nationalist interpretations; regional historiography of the Maritimes, central Canada and the West; selected historians and their historical methods.

Prerequisite(s): History 300.

History 535 **3 units; H(3S-0)**

Topics in American History

Selected topics in the history of the United States from the colonial period to the present.

Prerequisite(s): History 300.

MAY BE REPEATED FOR CREDIT

History 537 **3 units; H(3S-0)**

American Memories

Introduces students to the broad subject of historical memory, with a focus on the United States. Considers ways that historians have grappled with constructions of collective memory, personal memory, commemoration, and remembrance. Focuses on publicly controversial topics like remembering slavery, the Civil War, and the use of the Atomic Bomb in World War II.

Prerequisite(s): History 300.

Antirequisite(s): Credit for History 537 and 535.08 will not be allowed.

History 541 **3 units; H(3S-0)**

Topics in the History of Science

Selected aspects of the history of science, e.g., the scientific revolution, science and religion in the seventeenth century, history of scientific methods, studies of individual scientists such as Galileo, Boyle, Newton, or Darwin. For further information in the specific topics to be offered in any year, consult the History Department.

Prerequisite(s): History 300.

MAY BE REPEATED FOR CREDIT

History 543 **3 units; H(3S-0)**

Topics in Great Power Diplomacy and Intelligence

An exploration of selected themes in the history of modern statecraft. Topics may include: theories of international relations, war origins, treaty-making, Fascist diplomacy, appeasement, wartime alliances, intelligence and policy, cold war diplomacy. A seminar in which primary sources will be used.

Prerequisite(s): History 300 and one of 483, 485, 489, 491.01, 491.02.

History 545 **3 units; H(3S-0)**

Topics in Military History

An examination of selected problems in modern military history. Topics may include: military theory; guerrilla warfare from the eighteenth century to the twentieth century; evolution of tactics in World War I; development of military medicine; innovation in European armies; colonial wars.

Prerequisite(s): History 300 and one of 349, 379, 381, 383, 431, 471, 481, 483, 485, 489, 491.

MAY BE REPEATED FOR CREDIT

History 547 **3 units; H(3S-0)**

Chinese Strategic Thought

The history of Chinese strategic thought from antiquity through modernity, with emphasis on the Seven Military Classics, Chinese military history, and recent scholarship on the extent of the connection between historical and modern Chinese strategic thought.

Prerequisite(s): History 300.

History 551 **3 units; H(3-0)**
(Political Science 551)

Women in Canadian Politics

A political history of women in the twentieth and twenty-first centuries. Topics include campaigns for suffrage, legal personhood and equality rights, women's political activism, the evolution of public policy concerning women, and the participation of women in public life.

Prerequisite(s): History 300 and one of 343 or 438.

History 565 **3 units; H(3S-0)**

Slavery in Latin America and the Caribbean, 1492-1888

Themes may include the slave trade, plantation and urban slavery, resistance and rebellion, women, culture and religion, abolition, free people of colour in slave societies, and the post-abolition legacy.

Prerequisite(s): History 300.

History 569 **3 units; H(3S-0)**

Latin America and the Outside World

The Latin American nations in world affairs with special reference to their intellectual, economic, and political relations with Europe, North America, Africa, and the Pacific Rim. Themes will be drawn from the sixteenth to the twentieth centuries.

Prerequisite(s): History 300.

History 591 **3 units; H(3S-0)**

Directed Reading and Research
The analysis of historical problems and the use of primary sources. The content of each course will reflect the interests of the instructor.

Prerequisite(s): History 300 and consent of the Department.

Note: May not be used to fulfill the 500-level requirement for a Major in history without the written consent of the Department.

MAY BE REPEATED FOR CREDIT

History 593 **3 units; H(3-0)**

Selected Topics in History
Topics will vary from year to year, and will be announced in advance.

Prerequisite(s): History 300.

MAY BE REPEATED FOR CREDIT

History 597 **3 units; H(3-0)**

Honours Directed Reading
Directed readings for Honours students in their third or fourth year.

Prerequisite(s): History 300.

Antirequisite(s): Credit for History 597 and 596 will not be allowed.

History 598 **6 units; F(3-0)**

Honours Writing Seminar
The Honours Essay for Honours students in their fourth year.

Prerequisite(s): History 300.

Note: Students will work under the supervision of a faculty member, and are also expected to participate in sessions throughout the year that will normally be facilitated by the Honours Advisor.

Graduate Courses

Note: Only a limited number of these 600-level courses will be offered in any one year. Students may obtain further information from the Department.

Graduate students outside of the department are required to have department approval to register for any of the following courses:

History 601 **3 units; H(3-0)**

Topics in Imperial History
MAY BE REPEATED FOR CREDIT

History 603 **3 units; H(3-0)**

Topics in Religious History
MAY BE REPEATED FOR CREDIT

History 607 **3 units; H(3-0)**

Topics in Western Canadian History
MAY BE REPEATED FOR CREDIT

History 623 **3 units; H(3-0)**

Topics in Canadian History
An examination of crucial issues in Canada's political, economic, social and cultural history.

MAY BE REPEATED FOR CREDIT

History 633 **3 units; H(3-0)**

Topics in Modern European History
MAY BE REPEATED FOR CREDIT

History 637 **3 units; H(3-0)**

Topics in Military History
MAY BE REPEATED FOR CREDIT

History 639 **3 units; H(3-0)**

Topics in History of Science
Topics may include the scientific revolution, science and religion, and the reception of scientific ideas.

MAY BE REPEATED FOR CREDIT

History 641 **3 units; H(3-0)**

Topics in Medieval or Early Modern European History
MAY BE REPEATED FOR CREDIT

History 645 **3 units; H(3-0)**

Topics in U.S. History
MAY BE REPEATED FOR CREDIT

History 647 **3 units; H(3-0)**

Topics in Latin American History
MAY BE REPEATED FOR CREDIT

History 651 **3 units; H(3S-0)**

Reading Seminar

History 653 **3 units; H(3S-0)**

Research and Methods Seminar

History 655 **3 units; H(3-0)**

Classics of Strategy
Strategic thought from Sun Tzu to Clausewitz, Mahan to Corbett. Analyzes the writings of classic strategic thinkers, and then by way of case studies examines their theories as they pertain to military and political planners from the Peloponnesian War to the present.

History 673 **3 units; H(3-0)**

Topics in Legal History
MAY BE REPEATED FOR CREDIT

History 675 **3 units; H(3-0)**

Selected Topics in History
MAY BE REPEATED FOR CREDIT

History 690 **3 units; H(3-0)**

Historiography and the Theories of History

History 691 **3 units; H(3-0)**

Conference Course in Special Topics
Note: Open only to graduate students.

MAY BE REPEATED FOR CREDIT

History 791 **3 units; H(3S-0)**

Conference Course in Special Topics (Advanced Level)
Note: Open only to graduate students.

MAY BE REPEATED FOR CREDIT

History 795 **3 units; H(3S-0)**

Advanced Seminar in Historiographical Interpretations

Human Resources and Organizational Dynamics HROD

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Human Resources and Organizational Dynamics 317 **3 units; H(3-0)**

Organizational Behaviour
Examines individual, interpersonal and group processes to explain behaviour in organizations to better predict employee behaviour, and to interpret how context influences such behaviour. Topics may include motivation, groups and teams, decision-making, personality, power and influence, negotiation, leadership and stress.

Prerequisite(s): Admission to the Haskayne School of Business, and Business and Environment 291 or Strategy and Global Management 217.

Antirequisite(s): Credit for Human Resources and Organizational Dynamics 317 and 321 will not be allowed.

Human Resources and Organizational Dynamics 321 **3 units; H(3-0)**

Foundations in the Human Resources and Organizational Dynamics
Energies, skills and abilities of people to meet the challenge of today's organizations; diagnostic skills to recognize and analyze organizational problems; the linkage between effective management of people and goal accomplishment for organizations; current challenges in organizational forms, diverse environments and cultures; foundation for further study of Human Resources and Organizational Dynamics concepts.

Antirequisite(s): Credit for Human Resources and Organizational Dynamics 321 and 317 will not be allowed.

Note: Not available for credit towards the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Human Resources and Organizational Dynamics 401 **3 units; H(3-0)**

Competitive Advantage Through People
Analysis of the interdependencies and theoretical foundations of staffing and development programs, design and administration of reward and compensation systems and performance management programs from the orientation of professional human resources management.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 403 **3 units; H(3-0)**

Organizational Analysis and Change
Analysis of process of designing and structuring organizations and experience in the planning of design strategies as a response to change and innovation in the internal and external environment of the organizations.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 405 **3 units; H(3-0)**

Labour Relations
Examination of the nature and role of labour relations in the resolution of issues affecting employers, employees and the public interest.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 407 **3 units; H(3-0)**

Rationality and Decisions
An overview of key concepts in the decision sciences including normative, descriptive and prescriptive models of judgment and choice. This course emphasizes real-world applications of different decision making and decision support models.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Antirequisite(s): Credit for Human Resources and Organizational Dynamics 407 and 559.01 will not be allowed.

Human Resources and Organizational Dynamics 421 **3 units; H(3-0)**

Interpersonal Behaviour
Focus on increasing self-awareness, self-understanding and presentation of self. Interpersonal skills development necessary for group effectiveness and team management provide basis for performance leadership. Format involves learning in small groups.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 449 **3 units; H(3-1T)**

Arbitration of Employment Disputes
Workplace dispute resolution using arbitration. Topics include discipline, drug testing, surveillance, dress codes, discrimination, absenteeism, employment contracts. Emphasis on legal principles in employment arbitration, data base research, and advocacy skills using simulations, case law and guest speakers.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 491 **3 units; H(3-0)**

Lifework Planning and Career Assessment
Persons demonstrate competency in personal and career development by their ability to take personal responsibility for the quality of their lives. Assess skills and values and plan for personal and career development after graduation.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 493 **3 units; H(3-0)**

Business Negotiations
The major concepts and theories of bargaining and negotiation; the dynamics of interpersonal and intergroup conflict; analysis of bargaining and conflict relationships and exploration of individual bargaining styles. Application to a variety of negotiation situations. Use of simulations and written assignments.

Prerequisite(s): Admission to the Haskayne School of Business and 84 units (14.0 full-course equivalents) including Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 559 **3 units; H(3-0)**

Selected Topics in Management and Organizations
Examination of selected topics in management and organizations.

Prerequisite(s): Admission to the Haskayne School of Business and Human Resources and Organizational Dynamics 317.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Human Resources and Organizational Dynamics 601 **3 units; H(3-0)**

Managing Human Resources
Survey course on managing the human side of business. Development of leadership and team skills.

Human Resources and Organizational Dynamics 631 **3 units; H(3-0)**

Managing Human Resources from a Strategic Perspective
Integrated coverage of human resource management theory, practice and research as it applies to the strategic management of organizations.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 691 **3 units; H(3-0)**

Project Team Building and Interpersonal Skills
Leadership style and behaviour; interpersonal effectiveness and self-awareness; project teams; group dynamics; organizational change; application to the project environment.

Note: Available only to students in the MEng Program (Project Management). Not open to students in the MBA Program.

Human Resources and Organizational Dynamics 721 **3 units; H(3-0)**

Advanced Leadership and Technical Skills
Covers increasing self-awareness, self-understanding and presentation of self. The interpersonal skills necessary for group effectiveness, team management and performance leadership will be analyzed and developed through small group exercises.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 723 **3 units; H(3-0)**

Organizational Change and Development
Diagnosing organizational situations where the need for change exists and facilitating such changes. Utilization of behavioural science knowledge for organizational problem-solving.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 725 **3 units; H(3-0)**

Organizational Analysis and Design
Application of knowledge of organizational theory and behaviour to organizational analysis and design. Emphasis will be placed on the acquisition of the required analysis and design skills based on an understanding of how organizations are structured, how they function and their relationships with their environment.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 727 **3 units; H(3-0)**

Competitive Advantage Through People
Analysis of the interdependencies and theoretical foundations of staffing and development programs, design and administration of reward compensation systems and performance management programs from the orientation of professional human resources management.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 729 **3 units; H(3-0)**

Workplace Issues
Examination of the employment relationship, with a focus on controversial and significant topics in the workplace. Coverage may include: unjust dismissal; drug and alcohol testing; computer and Internet policies; privacy and surveillance; impact of unions; disability and accommodation; and workplace violence. Modular format with modules customized to meet student interests.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 731 **3 units; H(3-0)**

Lifework Planning and Career Assessment
Persons demonstrate competency in personal and career development by their ability to take personal responsibility for the quality of their lives. Students will clarify their competencies and values and plan for dealing with the challenges faced by mature adults.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 741 **3 units; H(3-0)**

Managerial Decision Making
Examines how decisions are made in organizations and how these decisions can be made more effectively, particularly at the top management and Board levels. Decision making in current business contexts are explored by way of simulations, case analyses, discussions, debates and written assignments.

Human Resources and Organizational Dynamics 745 **3 units; H(3-0)**

Cross-Cultural Leadership and Human Resources Management
Leadership of human resources in a cross-cultural and international context; the nature of cultural differences; influence on organizational processes and practices such as communication, leadership, decision-making, team dynamics, staffing, performance management and organizational design, and implications for those holding international managerial roles.

Human Resources and Organizational Dynamics 789 **3 units; H(3S-0)**

Seminar in the Management of Human Resources
Intensive study and discussion of current literature, research and issues with respect to selected topics in the management of human resources.

Prerequisite(s): Human Resources and Organizational Dynamics 601 or consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Human Resources and Organizational Dynamics 793 **3 units; H(3-0)**

Business Negotiations
The major concepts and theories of negotiation; the dynamics of interpersonal and intergroup conflict; analysis of negotiation strategies and individuals styles. Application to a broad range of business negotiations. Use of simulations and written assignments.

Prerequisite(s): Human Resources and Organizational Dynamics 601.

Human Resources and Organizational Dynamics 797 **3 units; H(3S-0)**

Advanced Seminar in Human Resources and Organizational Dynamics
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

PhD Course

Human Resources and Organizational Dynamics 799 **3 units; H(3S-0)**

Doctoral Seminars in Human Resources and Organizational Dynamics
799.01. Organizational Behaviour

799.02. Organization Theory

799.03. Industrial Relations

799.05. Interorganizational Relationships: Creating and Managing Strategic Alliances

Humanities HUMN

Instruction offered by members of the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Junior Course

Humanities 200 **6 units; F(1-2)**

Humanist Perspectives on Human Issues
Introduction to central issues and research methods in the Humanities, using primary source material from literature, religion, philosophy, and the arts. Texts will be studied from a variety of disciplinary and interdisciplinary perspectives. Tutorials will offer opportunities for discussion and instruction in academic writing and basic research methods.

Senior Courses

Humanities 305 **3 units; H(3-0)**

The Human Situation I
Examines various views concerning human nature, the human situation, and human responsibilities. Requires intensive reading of a moderate number of works of a literary, philosophical, or religious character that express such views.

Humanities 307 **3 units; H(3-0)**

The Human Situation II
A continuation of Humanities 305.

Prerequisite(s): Humanities 305.

Indigenous Languages INDL

Offered by the Department of Linguistics, Languages, and Culture in the Faculty of Arts.

Junior Courses

Indigenous Languages 205 **3 units; H(3-0)**
(formerly Native Languages 205)

Indigenous Language I
Primary emphasis on the acquisition of conversational skills and vocabulary. Different Indigenous languages may be offered from time to time.

Note: See the Schedule of Classes for specific offerings.

Indigenous Languages 207 **3 units; H(3-0)**
(formerly Native Languages 207)

Indigenous Language II
Continuation of Indigenous Languages 205, with special attention to grammatical structures and written materials.

Prerequisite(s): Indigenous Languages 205 or equivalent proficiency (in the same language).

Note: See the Schedule of Classes for specific offerings.

Indigenous Studies INDG

Instruction offered by members of the Faculties of Arts and Social Work as part of the Major in International Indigenous Studies or the Minor in Indigenous Studies. Please contact the Arts Students' Centre for specific details.

Junior Courses

Indigenous Studies 201 **3 units; H(3-0)**

Introduction to Indigenous Studies
A multi-disciplinary, theoretical and empirical overview of the situations, perspectives, and aspirations of selected Indigenous peoples with a focus on the Canadian context.

Senior Courses

Indigenous Studies 303 **3 units; H(3-0)**

Indigenous Ways of Knowing I
An introduction to various Indigenous peoples ways of knowing (epistemology) with a special emphasis on the contextualization of knowledge-building. Deals with various aspects of building knowledge, such as listening, reflection, protocol, and experience.

Antirequisite(s): Credit for Indigenous Studies 303 and any of Indigenous Studies 203, Social Work 203, Social Work 553.30 or Social Work 553.33 will not be allowed.

Note: Normally offered during Block Week. Pre-term study and field trip(s) are normally required and students will be required to cover field trip costs. Priority will be given to International Indigenous Studies majors and minors.

Indigenous Studies 305 **3 units; H(3-0)**

Indigenous Ways of Knowing II
An examination of the nature and relations of being (ontology) and specific responsibilities in cultural context. Integration of components of Indigenous ways of knowing. International comparison of Indigenous ways of knowing.

Prerequisite(s): One of Social Work 201, Indigenous Studies 203, Social Work 203, Indigenous Studies 303, Social Work 553.30, Social Work 553.33 or admission to the BSW Post Diploma.

Antirequisite(s): Credit for Indigenous Studies 305 and any of Indigenous Studies 205, Social Work 205, Social Work 553.31 or Social Work 553.34 will not be allowed.

Note: Normally offered in Block Week during Spring/Summer Intersession. Pre-term study and field trip(s) are normally required and students will be required to cover field trip costs. Priority will be given to International Indigenous Studies majors and minors.

Indigenous Studies 311 **3 units; H(3-0)**

Indigenous Governance
Principles that would establish which legitimate and lasting Aboriginal self-government are examined from both an urban and rural perspective. Examines the mechanisms that are being developed to meet political aspirations of Aboriginal peoples: Métis, Inuit, First Nations. Identifies key governance challenges facing Aboriginal communities.

Prerequisite(s): One of Anthropology 213, Canadian Studies 311, History 345, Indigenous Studies 201, or Sociology 307.

Indigenous Studies 312 **3 units; H(3-0)**
(formerly Indigenous Studies 311 and 313)

Cultural Immersion Field Course
Experience of ceremonial and cultural activities, with a focus on four themes: living values; spirituality; health and healing; and roles, responsibilities, and respect.

Prerequisite(s): One of Indigenous Studies 217, 317 or 303.

Note: Normally offered during Block Week in Spring/Summer Intersession. It may involve rugged field conditions and varying weather for which students must be prepared and equipped. Students will be required to cover field trip costs. Registration closes one month before course begins. Presession study may be required.

Indigenous Studies 317 **3 units; H(3-0)**
(formerly Indigenous Studies 217)

Ecological Knowledge
Experiential exploration, consideration, and application of Indigenous ecological knowledge, philosophies, and contemporary issues.

Note: Some field trip(s) are normally required. Students may be required to cover field trip costs.

Indigenous Studies 343 **3 units; H(3-0)**

Indigenous Law in Canada
Examination of the special legal and constitutional principles, provisions and instruments that have an impact on Indigenous individuals, governments and organizations. Topics covered may include aboriginal rights, treaty rights, self-government, fiduciary duties, the Royal Proclamation of 1763, the Indian Act, the 1982 Constitution, and pivotal court decisions.

Prerequisite(s): One of Anthropology 213, Canadian Studies 311, History 345, Indigenous Studies 201, or Sociology 307.

Indigenous Studies 397 **3 units; H(3-0)**

Special Topics in Canadian Indigenous Studies
Selected themes in Canadian Indigenous studies.

MAY BE REPEATED FOR CREDIT

Indigenous Studies 399 **3 units; H(3-0)**

Special Topics in International Indigenous Studies
Selected themes in International Indigenous studies. May focus on Indigenous peoples of only one country.

MAY BE REPEATED FOR CREDIT

Indigenous Studies 401 **3 units; H(3-0)**

Research in Selected Topics in International Indigenous Studies
Various topics in the area of International Indigenous Studies on the basis of special interest and need. Normally the course will have a research component.

Prerequisite(s): Consent of the program coordinator.

Indigenous Studies 407 **3 units; H(3-0)**

Comparative International Indigenous Communities
Social, economic, and political comparisons between selected Indigenous communities throughout the world.

Prerequisite(s): One of Anthropology 213, 337, Canadian Studies 311, History 345, Indigenous Studies 201, or Sociology 307.

Indigenous Studies 415 **3 units; H(3-0)**
(formerly Indigenous Studies 315)

Indigenous Ethics and Protocol
Examines principles underlying Indigenous ethics and academic and local research protocols, including indigenous ways of knowing, indigenous methodologies, notions of relationship, spirituality, community, and responsibility in academic research, teaching and learning when collaborating with Indigenous peoples.

Prerequisite(s): Indigenous Studies 303 and one of Anthropology 213, Canadian Studies 311, History 345, Indigenous Studies 201, or Sociology 307.

Indigenous Studies 502 **3 units; H(3-0)**

Selected Topics in Canadian Indigenous Studies
Investigation of selected topics in Indigenous issues in Canada.

Prerequisite(s): 60 units (10.0 full course equivalents), including one course in Indigenous Studies.

Antirequisite(s): Credit for Indigenous Studies 502 and 501 will not be allowed.

MAY BE REPEATED FOR CREDIT

Indigenous Studies 503 **3 units; H(3-0)**

Selected Topics in International Indigenous Studies
In-depth investigation of selected topics in international Indigenous issues.

Prerequisite(s): 60 units (10.0 full course equivalents), including one course in Indigenous Studies.

MAY BE REPEATED FOR CREDIT

Innovation INNO

Instruction offered by members of the Faculties of Arts and Science, Haskayne School of Business and the Schulich School of Engineering.

Senior Courses

Innovation 321 **3 units; H(3-0)**

Principles of Innovation
Innovation is a process through which knowledge and new ideas are applied to create new economic and social benefits. Students are introduced to definitions, contexts, language, dynamics, historical and contemporary examples, issues, aspects, outcomes, pitfalls, and impacts of the innovation process from a multidisciplinary perspective. Literature on innovation is explored. Seeks to develop in students the intuitive and imaginative skills necessary for inventive processes, and to investigate the impact of the innovation process. Blend of face-to-face and web-based instruction.

Note: Open to students from all programs.

Innovation 323 **3 units; H(3-0)**

The Practice of Innovation
Provides experience in the innovation process, to aid students to understand the nature of this creative process in different contexts, and to nurture innovative thinking. Hands-on project in multidisciplinary teams of students and professors. Student projects will take the form of case studies of and/or involvement in actual innovation processes in different contexts. Seeks to teach through experience and peer-based interaction the processes of invention. Term will end with an "innovation fair" of teams' presentations. Blend of face-to-face and web-based instruction.

International Foundations Program IFPX

Students must be admitted into the International Foundations Program to enrol in these courses, or by consent of the International Foundations Program office. Students will be registered by IFP in all courses depending on their placement in the Pathways, Bridging or Preparation stream.

Note: These courses may not be audited.

International Foundations Program 150 **6 units; F(10-0)**
(formerly English for Academic Purposes Program 150)

Academic Writing and Grammar
Develop basic writing and grammar skills of standard written English. The focus is placed on the development of simple and compound sentences. Students will also learn appropriate use of modifiers, noun phrases, past and future verb tenses, repositions, comparatives, articles, spelling, punctuation and work on expanding their range of academic vocabulary.

Prerequisite(s): Admission to IFP Preparation stream.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations Program 153 **3 units; H(5-0)**
(formerly English for Academic Purposes Program 153)

Reading Comprehension and Proficiency
The development of academic literacy skills. Topics covered are reading for comprehension, improvement in reading speed, and vocabulary expansion. Development of dictionary and thesaurus skills via use of monolingual English dictionaries and thesauri will also be an essential aspect of the course. Other sub-topics covered will be word forms, determining meaning for words in context, and the use of basic affixes in the prediction of meaning.

Prerequisite(s): Admission to IFP Preparation stream.

Corequisite(s): International Foundations Program 150 and 157.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations Program 157 **3 units; H(5-0)**
(formerly English for Academic Purposes Program 157)

Listening Comprehension and Oral Fluency
Continues the development of basic listening comprehension and speaking skills. Listening strategies and exercises will focus on comprehension of live or recorded audio instructions. Students will focus on comprehension and identification of vocabulary, argument development, main ideas and other specific details during listening practice. Speaking will focus on oral grammar, pronunciation, and basic rules of Canadian English discourse.

Prerequisite(s): Admission to IFP Preparation stream.

Corequisite(s): International Foundations Program IFPX 150 and 153.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations Program 160 **6 units; F(10-0)**
(formerly English for Academic Purposes Program 160)

Academic Writing and Grammar
Develop writing fluency through study and practice of compound and complex sentence patterns used in standard written English. The main focus will be the process of paragraph analysis and composition. A also integrates aspects of complex grammar structures and their appropriate usage.

Prerequisite(s): International Foundations Program 150, 153, and 157 or admission to IFP Preparation stream.

Corequisite(s): International Foundations Program IFPX 163 and 167.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations Program 163 **3 units; H(5-0)**
(formerly English for Academic Purposes Program 163)

Reading Comprehension and Proficiency
Emphasizes the development of academic literacy skills. Instruction will be focused on recognition of word pair analogies, common idiomatic expressions, and higher-level vocabulary. Students will also learn about inference, context clues, and predicting meaning from their readings, as well as multiple genres of reading materials in fiction and non-fiction.

Prerequisite(s): International Foundations Program 150, 153, and 157 or admission to IFP Preparation stream.

Corequisite(s): International Foundations Program 160 and 167.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 167 3 units; H(5-0)
(formerly English for Academic Purposes Program 167)

Listening Comprehension and Oral Fluency
A continuation of the development of listening comprehension and speaking skills. Focus will be placed on the development of pronunciation skills, public speaking, formal class presentations, appropriate use of verbal and non-verbal communication techniques, and development of interviewing strategies. Listening strategies and exercises will focus on comprehension of live or recorded audio instructions and stories.

Prerequisite(s): International Foundations Program 150, 153, and 157 or admission to IFP Preparation stream.

Corequisite(s): International Foundations Program 160 and 163.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 250 3 units; H(3-0)

Introduction to Academic Written Communication Skills for Engineering
Introductory scientific writing skills including reading in scientific texts to develop research skills, sense of audience, tone, register, organization patterns, grammar and mechanical concepts, and vocabulary, with a focus on lab reports.

Prerequisite(s): Admission to the IFP Pathways stream with Schulich School of Engineering.

Note: Not available for credit towards degree programs outside of Schulich School of Engineering. See Schulich School of Engineering Degree Program Details for further information.

International Foundations
Program 257 3 units; H(3-0)

Introduction to Academic Oral Communication Skills for Engineering
Academic oral language skills in technical/scientific contexts including presentations, group problem solving, creating lecture notes, and pronunciation, as well as effective study skills and habits.

Prerequisite(s): Admission to the IFP Pathways stream with Schulich School of Engineering.

Note: Not available for credit towards degree programs outside of Schulich School of Engineering. See Schulich School of Engineering Program Details for further information.

International Foundations
Program 270 6 units; F(10-0)

Academic Writing and Grammar
Designed for low to high intermediate students of English as an additional language. A focus on skills required for writing academic paragraphs, from brainstorming ideas to the final written product. The paragraph writing will progress to essay writing through the course requiring a more precise use of language for description, opinion and explanation. Writers will practice their critical thinking skills as they analyze and evaluate the topic-related issues and develop their own ideas and ways to express them.

Prerequisite(s): International Foundations Program 160, 163 and 167 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 273 and 277.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 273 3 units; H(5-0)
(formerly English for Academic Purposes Program 173)

Reading Comprehension and Proficiency
Designed for low to high intermediate students of English as an additional language. Students will use a variety of strategies to read academic and non-academic text to build vocabulary in context, and to understand how authors structure language to communicate information and opinion in different types of compositions. Students will practice their critical thinking skills as they analyze and evaluate the readings and express their own ideas.

Prerequisite(s): International Foundations Program 160, 163 and 167 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 270 and 277.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 277 3 units; H(5-0)
(formerly English for Academic Purposes Program 177)

Listening Comprehension and Oral Fluency
Designed for mid-level to high intermediate English as a second language students. Students will practice and develop their listening skills covering a wide range of academic topics in a variety of presentation styles. Improving pronunciation and practicing communication skills for a variety of settings along with the development of critical thinking.

Prerequisite(s): International Foundations Program 160, 163 and 167 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 270 and 273.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 280 6 units; F(10-0)
(formerly English for Academic Purposes Program 167)

Academic Writing and Grammar
To improve high intermediate to low advanced students' academic writing skills. Refine the essay structure with a focus on mastering the chronological, comparison and contrast essays. Emphasis will be placed upon the sequence of steps in the writing process. Students will learn varied sentence types, more sophisticated writing techniques, advanced grammar, research topics, and documenting academic references

Prerequisite(s): International Foundations Program 270, 273 and 277 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 283 and 287.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 283 3 units; H(5-0)
(formerly English for Academic Purposes Program 183)

Reading Comprehension and Proficiency
For high intermediate to low advanced students to continue to refine their reading skills within theme-based chapters. Students will build academic vocabulary, study word derivatives, and will increase their ability to use an advanced English dictionary. Students will learn and use critical thinking strategies to respond to texts and articles through discussion, debate and written assignments. In addition, students will begin to explore academic journals of interest to their future studies.

Prerequisite(s): International Foundations Program 270, 273 and 277 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 280 and 287.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 287 3 units; H(5-0)
(formerly English for Academic Purposes Program 183)

Listening Comprehension and Oral Fluency
High intermediate to low advanced students continue to develop their academic listening and speaking skills. Students will hone critical thinking skills, academic vocabulary and practice pronunciation. Students will also attend on-campus lectures of their choice to practice note-taking.

Prerequisite(s): International Foundations Program 270, 273 and 277 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 280 and 283.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 290 6 units; F(10-0)
(formerly English for Academic Purposes Program 183)

Academic Writing and Grammar
Develop advanced writing skills while reviewing the various organizational patterns for multi-disciplinary academic essays. Advanced grammatical and mechanical concepts are fostered. Students will develop an understanding of the process approach to writing, appropriate referencing, documenting, paraphrasing and summarizing. Critical thinking strategies will be promoted in order for students to create individual conclusions about issues.

Prerequisite(s): International Foundations Program 280, 283 and 287 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 293 and 297.

Note: Not available for credit unless otherwise noted in the faculty IFP section.

International Foundations
Program 293 3 units; H(5-0)
(formerly English for Academic Purposes Program 193)

Reading Comprehension and Proficiency
Develop advanced reading skills and effective reading strategies for the genres of text found at the undergraduate level. These texts will be used for obtaining information and building vocabulary. Students will employ critical thinking strategies in order to reach independent conclusions and respond analytically.

Prerequisite(s): International Foundations Program 280, 283 and 287 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 290 and 297.

Note: Not available for credit unless otherwise noted in the faculty IFP section. Students may take one 3 unit (half course), with IFP Academic Coordinator approval, while enrolled in Tier 3 courses.

International Foundations Program 297 3 units; H(5-0)
(formerly English for Academic Purposes Program 197)

Listening Comprehension and Oral Fluency
Master the listening and speaking skills necessary for undergraduate study. Lectures from a variety of disciplines will be analyzed so that students can develop valuable comprehension strategies, including preparing for a lecture and taking effective notes. Academic discussions about complex, abstract and detailed topics covered in the lectures will be held in order to analyze, problem-solve and make decisions. Oral presentation techniques, pronunciation and critical thinking strategies will be further explored by the students.

Prerequisite(s): International Foundations Program 280, 283 and 287 or admission to IFP Bridging or Preparation streams.

Corequisite(s): International Foundations Program 290 and 293.

Note: Not available for credit unless otherwise noted in the faculty IFP section. Students may take one 3 unit (half course), with IFP Academic Coordinator approval, while enrolled in Tier 3 courses.

International Foundations Program 350 3 units; H(3-0)

Advanced Academic Written Communication Skills
Advanced scientific and technical communication for extensive writing tasks in the Schulich School of Engineering. Participants will read scientific and technical writing, develop research skills and information literacy, critically analyze data, enrich vocabulary focused on scientific contexts, and foster rhetorical understanding and synthesis of information.

Prerequisite(s): International Foundations Program 250.

Note: Not available for credit towards degree programs outside of Schulich School of Engineering. See Schulich School of Engineering Program Details for further information.

International Foundations Program 357 3 units; H(3-0)

Advanced Academic Oral Communication Skills
Advanced academic oral language and academic communication skills for use in the Schulich School of Engineering. Participants will learn skills for communication in technical contexts, and develop fluency, accuracy and clarity. Tasks will include note taking on extended lectures, research and critical thinking, presentations, discussion leading and group problem-solving.

Prerequisite(s): International Foundations Program 257 and admission to the IFP Pathways stream.

Note: Not available for credit towards degree programs outside of Schulich School of Engineering. See Schulich School of Engineering Program Details for further information.

International Foundations Program 451 3 units; H(3-0)

Introduction to Academic Written Communication
Basic scientific writing skills and written academic communication expectations for use in engineering contexts. Focus will include how to read scientific texts, developing research skills, written communication contexts, grammar and mechanical concepts, and audience, as well as developing academic and scientific vocabulary.

Prerequisite(s): Consent of the Department.

International Foundations Program 455 3 units; H(3-0)

Introduction to Academic Oral Communication
Participants will develop their English speaking and listening skills for use in engineering contexts through participation in academic presentations, note-taking, and group problem solving scenarios.

Prerequisite(s): Consent of the Department.

International Foundations Program 459 3 units; H(5-0.5T)

Fundamental Academic Communication
An introduction to the academic culture and communication expectations for study including physical and online infrastructure, as well as improve language skills necessary to navigate university entrance and commence studies.

Prerequisite(s): Consent of the Department.

International Foundations Program 559 3 units; H(5-0.5T)

Advanced Academic Communication
Participants will develop writing for scientific reports, technical writing, and applications, and develop reading skills for identifying bias, synthesizing information, vocabulary acquisition and researching. Presentation skills, as well as note-taking and questioning strategies, will also be practiced.

Prerequisite(s): Consent of the Department.

International Foundations Program Engineering IFPE

Students must be admitted into the International Foundations Program to enrol in these courses, or by consent of the International Foundations Program office. Students will be registered by IFP in all courses depending on their placement in the Pathways, Bridging or Preparation stream.

Note: These courses may not be audited.

International Foundations Program Engineering 200 1 unit; (1.5-0)

Adjunct for Engineering 200
English language support for IFP Pathway students taking Engineering 200. Focus on language and study skills for the successful completion of Engineering 200. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Engineering 200.

International Foundations Program Engineering 201 1 unit; (1.5-0)

Adjunct for Engineering 201
English language support for IFP Pathway students taking Engineering 201. Focus on language and study skills for the successful completion of Engineering 201. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Engineering 201.

International Foundations Program Engineering 202 1 unit; (1.5-0)

Adjunct for Engineering 202
English language support for IFP pathway students taking Engineering 202. Focus on language and study skills for the successful completion of Engineering 202. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Engineering 202.

International Foundations Program Engineering 209 1 unit; (1.5-0)

Adjunct for Chemistry 209
English language support for IFP pathway students taking Chemistry 209. Focus on language and study skills for the successful completion of Chemistry 209. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Chemistry 209.

International Foundations Program Engineering 211 1 unit; (1.5-0)

Adjunct for Mathematics 211
English language support for IFP pathway students taking Mathematics 211. Focus on language and study skills for the successful completion of Mathematics 211. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Mathematics 211.

International Foundations Program Engineering 225 1 unit; (1.5-0)

Adjunct for Engineering 225
English language support for IFP pathway students taking Engineering 225. Focus on language and study skills for the successful completion of Engineering 225. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Engineering 225

International Foundations Program Engineering 233 1 unit; (1.5-0)

Adjunct for Engineering 233
English language support for IFP pathway students taking Engineering 233. Focus on language and study skills for the successful completion of Engineering 233. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Engineering 233.

International Foundations Program Engineering 259 1 unit; (1.5-0)

Adjunct for Physics 259
English language support only IFP pathway students taking Physics 259. Focus on language and study skills for the successful completion of Physics 259. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Physics 259.

International Foundations Program Engineering 275 **1 unit; (1.5-0)**

Adjunct for Mathematics 275
English language support for IFP pathway students taking Mathematics 275. Focus on language and study skills for the successful completion of Mathematics 275. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Mathematics 275.

International Foundations Program Engineering 277 **1 unit; (1.5-0)**

Adjunct for Mathematics 277
English language support for IFP pathway students taking Mathematics 277. Focus on language and study skills for the successful completion of Mathematics 277. Simplifying and personalizing class notes; and developing skills to critically analyze and synthesize content of the above course.

Prerequisite(s): Admission to IFP Pathways stream.

Corequisite(s): Mathematics 277.

International Relations INTR

Instruction offered by the Department of Political Science in the Faculty of Arts.

Senior Courses

International Relations 301 **3 units; H(3-0)**

A Multidisciplinary Survey of International Relations
A survey of International Relations integrating the approaches applied in various Social Sciences disciplines.

Note: Open only to majors in the International Relations program.

International Relations 501 **3 units; H(3-0)**

Advanced Seminar in International Relations
An integrative seminar on selected themes from the International Relations field.

Prerequisite(s): International Relations 301 and third or fourth year standing.

Note: Open only to majors in the International Relations program.

International Relations 597 **3 units; H(3-0)**

Directed Study in International Relations
Prerequisite(s): Consent of the Program Co-ordinator.

Note: Normally open only to third and fourth year majors in International Relations. Students wishing to register in this course must submit to the Program Co-ordinator a detailed statement by the instructor of the work to be carried out.

MAY BE REPEATED FOR CREDIT

Internship INTE

Senior Courses

Internship 503 **15 units; (4 months)**

Internship in Computer Science
503.01. Internship in Computer Science I
503.02. Internship in Computer Science II
503.03. Internship in Computer Science III
503.04. Internship in Computer Science IV
NOT INCLUDED IN GPA

Internship 513 **15 units; (4 months)**

Internship in Engineering
513.01. Internship in Engineering I
513.02. Internship in Engineering II
513.03. Internship in Engineering III
513.04. Internship in Engineering IV
NOT INCLUDED IN GPA

Internship 591 **15 units; (4 months)**

Professional Theatre Internship
Internship experience with a local professional theatre organization.
591.01. Professional Theatre Internship I
591.02. Professional Theatre Internship II

Prerequisite(s): Admission to BFA Drama, 90 unit (15 full-course equivalents) and consent of the Division Chair, Drama.

Antirequisite(s): Credit for Internship 591 or any of Drama 590, 591 or 593 will not be allowed.

NOT INCLUDED IN GPA

Interprofessional Health Education IPHE

Senior Courses

Interprofessional Health Education 501 **3 units; H(3-0)**
(Interprofessional Health Education 601)

Interprofessional Practice in Mental Health
Students from different helping professions come together to examine selected issues of interprofessional practice in the area of mental health and co-occurring addictive disorders, focusing on the experience of mental illness, treatment alternatives, practice implications, advocacy and policy issues, and future challenges and change. Incorporates in-class and field experiences with consumers and families, employers and professionals, services and organizations.

Prerequisite(s): One of Community Rehabilitation 209, 425, Kinesiology 355, Nursing 303, 305, Psychology 203, 205, Social Work 363, or consent of the Instructor(s).

Interprofessional Health Education 503 **3 units; H(3-0)**
(Interprofessional Health Education 603)

Interprofessional Practice in Addictions
Students from different helping professions come together to examine aspects of addictions assessment, treatment and recovery and issues of co-occurring mental health disorders in an interprofessional context. Studies include the complex array of treatments, programs and supports available in a Canadian context, and critical examination of the ancillary issues of community care, and other support services that are required for successful recovery and relapse prevention for those with addictive disorders and co-occurring mental health issues.

Prerequisite(s): One of Community Rehabilitation 209, 425, Kinesiology 355, Nursing 303, 305, Psychology 203, 205, Social Work 363, or consent of the Instructor(s).

Interprofessional Health Education 598 **3 units; H(3-0)**

Selected Topics in Interprofessional Health Education
Course topics focusing on interprofessional practice amongst health science professions.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Interprofessional Health Education 601 **3 units; H(3-0)**
(Interprofessional Health Education 501)

Interprofessional Practice in Mental Health
Students from different helping professions come together to examine selected issues of interprofessional practice in the area of mental health and co-occurring addictive disorders, focusing on the experience of mental illness, treatment alternatives, practice implications, advocacy and policy issues, and future challenges and change. Incorporates in-class and field experiences with consumers and families, employers and professionals, services and organizations.

Prerequisite(s): Consent of the Instructor(s).

Interprofessional Health Education 603 **3 units; H(3-0)**
(Interprofessional Health Education 503)

Interprofessional Practice in Addictions
Students from different helping professions come together to examine aspects of addictions assessment, treatment and recovery, and issues of co-occurring mental health disorders in an interprofessional context. Studies include the complex array of treatments, programs and supports available in a Canadian context, and critical examination of the ancillary issues of community care, and other support services that are required for successful recovery and relapse prevention for those with addictive disorders and co-occurring mental health issues.

Prerequisite(s): Consent of the Instructor(s).

Interprofessional Health Education 605 **3 units; H(3-2)**

Interprofessional Approaches to Assessment, Diagnosis and Treatment in Mental Health and Addictions: The Major Disorders - Part A
Complex facets of assessment and diagnosis (using DSM classification system) of depressive, anxiety, psychotic and alcohol disorders. Team investigation of treatment programs and supports available within a Canadian context.

Prerequisite(s): Consent of the Instructor(s).

Interprofessional Health Education 607 **3 units; H(3-2)**

Interprofessional Approaches to Assessment, Diagnosis and Treatment in Mental Health and Addictions: Personality Disorders and Special Populations - Part B
Complex facets of assessment and diagnosis of personality disorders, developmental disorders, special populations and addictive disorders. Team investigation of treatment programs and supports available within a Canadian context.

Prerequisite(s): Consent of the Instructor(s).

Interprofessional Health Education 609 **3 units; H(3-2)**

Psychiatric, Psychosocial and Recovery Approaches in Mental Health and Addictions
Interprofessional approaches to culture, relationships, teams and roles in the delivery of mental health and addictions care.

Prerequisite(s): Consent of the Instructor(s).

Interprofessional Health Education 611 **3 units; H(3-1)**

Special Topics in Interprofessional Mental Health Addictions
Topics such as age or special populations, methods and systems will be added from existing faculty offerings or will be created as needed through interfaculty collaboration.

Prerequisite(s): Consent of the Instructor(s).

MAY BE REPEATED FOR CREDIT

Israel Studies ISST

Instruction and services offered by members of the Faculty of Arts.

Graduate Course

Israel Studies 601 **3 units; H(3-0)**

Modern Israel
Discussion of major themes in the origin and establishment of modern Israel. Topics may include emancipation and Zionism; nation building; social, ethnic, and religious composition; human rights, equality and gender, economic, political, and cultural institutions.

MAY BE REPEATED FOR CREDIT

Italian ITAL

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Arts.

Italian-speaking students, native speakers or students with previous knowledge of Italian must consult the Department to be placed in a course corresponding to their level of linguistic competence. Native speakers are not eligible to take language courses by special assessment or to receive advanced credit for them.

Junior Courses

Italian 201 **3 units; H(3-1)**

Beginners' Italian I
This course, designed for students with no previous knowledge of the language, provides training in the comprehension, speaking, reading and writing of Italian.

Antirequisite(s): Credit for Italian 201 and 30 will not be allowed.

Italian 203 **3 units; H(3-1)**

Beginners' Italian II
A continuation of Italian 201.

Prerequisite(s): Italian 30, Italian 201 or equivalent.

Senior Courses

Italian 301 **3 units; H(3-1T)**

Second-Year Italian I
An intensive course in reading, writing and oral practice.

Prerequisite(s): Italian 203.

Italian 303 **3 units; H(3-1T)**

Second-Year Italian II
Further development of communication skills in Italian (listening, speaking, writing, reading), as well as the study of cultural issues in the Italian world with emphasis on reading.

Prerequisite(s): Italian 301.

Italian 305 **3 units; H(3-1)**

Introduction to Textual Analysis
Development of critical thinking and communicative skills through the analysis of selected literary and non literary texts.

Prerequisite(s): Italian 301.

Italian 307 **3 units; H(3-1)**

Communication
Study of different types of communication (print and electronic media, correspondence, business). Analysis of relevant aspects of Italian contemporary life.

Prerequisite(s): Italian 301.

Italian 309 **3 units; H(3-1)**

Civilization: Culture and the Arts
Aspects of Italian civilization and contemporary cultural issues in Italian Studies.

Prerequisite(s): Italian 203.

Italian 401 **3 units; H(3-1T)**

Third-Year Italian I
A course in composition and conversation for advanced students in Italian. Selected readings from literary texts.

Prerequisite(s): Italian 301, 303 and 3 units of Italian at the senior level (including Romance Studies 341).

Italian 403 **3 units; H(3-1T)**

Third-Year Italian II
Intensive study of Italian grammar with the goal of attaining greater proficiency in written and oral communication. Grammatical analysis, vocabulary enrichment and development of conversation skills dealing with cultural issues.

Prerequisite(s): Italian 301, 303 and 3 units of Italian at the senior level (including Romance Studies 341).

Italian 405 **3 units; H(3-0)**

Selected Works in Italian Literature
Introduction to Italian literature with particular emphasis on the novel and poetry.

Prerequisite(s): Italian 301, 303 and 3 units of Italian at the senior level (including Romance Studies 341).

MAY BE REPEATED FOR CREDIT

Italian 407 **3 units; H(3-0)**

Performance as Cultural Expression
Study of Italian theatre, opera and drama as well as popular forms of cultural expression such as festival, music and figurative art.

Prerequisite(s): Italian 301, 303 and 3 units of Italian at the senior level (including Romance Studies 341).

Italian 409 **3 units; H(3-2)**

Italian Culture through Cinema
Significant social, cultural and historical issues in Italian society through the medium of film.

Prerequisite(s): Italian 301, 303 and one other course at the senior level (including Romance Studies 341).

Italian 499 **3 units; H(3-0)**

Selected Topics in Italian Studies I
Selected topics in Italian language, literature or civilization.

Prerequisite(s): Italian 301, 303 and one other course at the senior level in Italian.

MAY BE REPEATED FOR CREDIT

Italian 501 **3 units; H(3-0)**

Interdisciplinary Study of Italian Culture
Capstone project in Italian studies. Analytical discussion of selected topics each related to students' field of concentration.

Prerequisite(s): Italian 301, 303 and one other course at the senior level in Italian and consent of the instructor.

Italian 502 **3 units; H(3-0)**
(formerly Italian 503)

Advanced Textual Analysis
Discussion of selected topics in Italian language, literature or culture. Course designed to develop writing skills. Review of writing strategies, spelling, punctuation, expository and argumentative techniques, using various original sources taken from journalistic, scientific, and literary texts as well as from other media.

Prerequisite(s): Italian 301, 303 and one other course at the senior level in Italian and consent of the instructor.

MAY BE REPEATED FOR CREDIT

Italian 597 **3 units; H(0-3T)**

Directed Reading
Directed reading for students in their third or fourth year. Qualified students will undertake research projects in their specified field of interest under the supervision of a faculty member.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Italian 599 **3 units; H(3-0)**

Selected Topics in Italian Studies II
A specialized course for advanced students. Course may be offered as a seminar or as a directed readings course.

Prerequisite(s): Italian 301, 303 and one other course at the senior level in Italian and consent of the instructor.

MAY BE REPEATED FOR CREDIT

Japanese JPNS

Instruction offered by the Department of Linguistics, Languages, and Culture in the Faculty of Arts. Students are encouraged to consult the Department website (llc.ucalgary.ca/) for more details on course descriptions and titles of decimalized courses.

Note: Japanese 317 is given in English and no knowledge of Japanese is required.

Junior Courses

Japanese 205 **3 units; H(4-1)**

Beginners' Japanese I
Basic concepts of modern Japanese. Reading and writing of characters, essentials of grammar, basic vocabulary, and oral drills on normal speech patterns.

Antirequisite(s): Credit for Japanese 205 and 30 will not be allowed

Japanese 207 **3 units; H(4-1)**

Beginners' Japanese II
Continuation of Japanese 205.

Prerequisite(s): Japanese 30 or Japanese 205.

Senior Courses

Japanese 301 **3 units; H(3-1)**

Continuing Japanese I
Further acquisition of Japanese characters, and the development of conversational skills through reading and discussion of selected Japanese texts. Structural analysis of normal speech patterns. Preparation of written assignments. A continuation of Japanese 207.

Prerequisite(s): Japanese 207.

Japanese 303 **3 units; H(3-1)**

Continuing Japanese II
Continuation of Japanese 301.

Prerequisite(s): Japanese 301.

Japanese 309 **3 units; H(3-2)**

Japanese Culture in an Immersion Setting
Introduction to contemporary Japanese culture through research projects and life experience. This course is given during Spring/Summer Intersession in Japan.

Prerequisite(s): Japanese 207 or equivalent and consent of the Department.

Japanese 311 **3 units; H(3-1)**

Japanese Language in an Immersion Setting I
Stresses oral skills and cultural understanding in an immersion setting. While the focus will be on speaking and aural comprehension, reading and writing will also be introduced. This course is given during Spring/Summer Intersession in Japan.

Prerequisite(s): Japanese 207.

Corequisite(s): Japanese 309.

Japanese 313 **3 units; H(3-1)**

Japanese Language in an Immersion Setting II
A continuation of Japanese 311. This course is given during Spring/Summer Intersession in Japan.

Prerequisite(s): Japanese 311.

Japanese 317 **3 units; H(3-0)**

Topics in Japanese Civilization
Distinctive features of Japanese civilization within the Asian context.

317.01. Japanese Civilization

317.02. Japanese Cultural History Through Film

Note: Taught in English. This course may be repeated for credit where the course content is different, as indicated by a different decimal number for the course. May be repeated for a maximum credit of 6 units (1.0 full-course equivalent).

Japanese 331 **3 units; H(3-0)**

Intermediate Japanese I
An intermediate course giving emphasis to both writing and oral skills. Some of the more difficult aspects of modern Japanese grammar will be studied.

Prerequisite(s): Japanese 303.

Japanese 333 **3 units; H(3-0)**

Intermediate Japanese II
A continuation of Japanese 331.

Prerequisite(s): Japanese 331.

Japanese 341 **3 units; H(3-0)**

Introduction to Japanese Literature
Reading and discussion of selected works of modern Japanese literature.

Prerequisite(s): Japanese 303.

Japanese 441 **3 units; H(3-0)**

Advanced Conversational Japanese
Intensive development of aural and oral skills in Japanese through discussion of selected topics using a variety of authentic media. The focus will be on developing conversational abilities and vocabulary.

Prerequisite(s): Japanese 331.

Japanese 451 **3 units; H(3-0)**

Japanese Through Texts
Language practice and cultural analysis through the study of contemporary Japanese texts. Authentic material will be selected from documents and textbooks. Students will be able to improve their reading skills while enhancing their knowledge of Japanese culture.

Prerequisite(s): Japanese 331.

Japanese 461 (Chinese 461) **3 units; H(3-0)**

Japanese-Chinese Cultural Relations
Discussion of cultural relations and influences between Japan and China. Topics may include cultural identities and cross-influences, literary and artistic traditions, and writing systems.

Prerequisite(s): Japanese 303 or higher (excluding Japanese 317).

Note: Knowledge of Chinese would be beneficial.

Kinesiology KNES

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education and Physical Education.

Junior Courses

Kinesiology 201 **3 units; H(2-3)**

Activity: Essence and Experience
Experience in various activities and movement patterns and the study of the fundamental factors that influence the activities we choose and the way we move.

Prerequisite(s): Biology 30.

Kinesiology 203 **3 units; H(2-2)**

Activity: Health, Fitness, and Performance
A variety of activities to experience the short-term benefits of exercise.

Prerequisite(s): Biology 30.

Note: Students are responsible for completing a Physical Activity Readiness Questionnaire (PAR-Q & You / PAR-Q+) and obtain medical clearance if required.

Kinesiology 213 **3 units; H(2-1)**

Introduction to Research in Kinesiology
An introduction to research in kinesiology with an emphasis on understanding the research process, including basic statistical knowledge, and its relationship to critical thinking. Practical application of concepts through direct involvement in individual and group projects.

Prerequisite(s): Biology 30, Chemistry 30, and Mathematics 30-1.

Kinesiology 237 **3 units; H(3-0)**

Introduction to Nutrition
Provides students with a basic understanding of the role of nutrition in health and fitness.

Prerequisite(s): Biology 241 or 231 or Kinesiology 259.

Kinesiology 244 (formerly Kinesiology 245) **3 units; H(2-1)**

Introduction to Socio-Cultural Aspects of Sport
An introduction to thinking critically about the relationship between sport and the larger social context, with an emphasis on social norms, politics, ethics, and historical perspectives.

Prerequisite(s): Mathematics 30-1.

Antirequisite(s): Credit for Kinesiology 244 and either Kinesiology 303.44 or Sociology 399 will not be allowed.

Kinesiology 251 **3 units; H(3-1/3)**

Introduction to Motor Control and Learning
An introduction to neural and cognitive concepts underlying human behaviour in physical activity and health.

Prerequisite(s): Biology 30.

Kinesiology 253 **3 units; H(3-1/3)**

Introduction to Exercise and Sport Psychology
An introduction to the psycho-social concepts underlying an understanding of human behaviour in physical activity, sport, and health.

Kinesiology 259 **3 units; H(3-2)**

Human Anatomy and Physiology I
The instructional approach is a combination of systematic and regional anatomy and physiology with some surface anatomy and radiologic considerations. General cell physiology, bone anatomy, neurophysiology and muscular physiology, as well as skeletal structure, types of connective tissues, structure of joints and muscles of the axial and appendicular skeleton will be covered. Laboratories utilize human tissue materials, anatomical models, charts, and prosected cadavers and cadaver specimens.

Prerequisite(s): Biology 30, Chemistry 30, and Mathematics 30-1 or Pure Mathematics 30 or Mathematics 30-2 for Nursing students only.

Antirequisite(s): Credit for Kinesiology 259 and any of Biology 305, Medical Science 404, Nursing 221, Zoology 269, 461 or 463 will not be allowed.

Kinesiology 260 **3 units; H(3-2)**

Human Anatomy and Physiology II
The instructional approach is a combination of systematic and regional anatomy and physiology with some surface anatomy and radiologic considerations. Physiology and anatomy of the cardiovascular, pulmonary, endocrine, renal and gastrointestinal systems as well as anatomy of the reproductive and integumentary systems and special senses will be covered. Laboratories utilize human tissue materials, anatomical models, charts, and prosected cadavers and cadaver specimens.

Prerequisite(s): Kinesiology 259.

Antirequisite(s): Credit for Kinesiology 260 and any of Biology 305, Medical Science 404, Nursing 222, Zoology 269, 461 or 463 will not be allowed.

Kinesiology 263 **3 units; H(3-1T)**

Quantitative Biomechanics
Basic principles of force system analysis, impulse-momentum, work-energy and particle kinematics applied to biological structures, including extensive mathematical analyses.

Prerequisite(s): Kinesiology 259 and one of Mathematics 30-1, Pure Mathematics 30 or Mathematics 31.

Corequisite(s): Prerequisite or Corequisite: Kinesiology 201 and 260.

Senior Courses

Kinesiology 303 **3 units; H(3-0)**

Special Topics in Kinesiology
MAY BE REPEATED FOR CREDIT

Kinesiology 311 **3 units; H(2-1)**

Leadership Foundations
Contemporary leadership best practices with a focus on physical activity, pedagogy and sport coaching. Linking leadership theory with critical reflection.

Prerequisite(s): Admission to the Faculty of Kinesiology.

Antirequisite(s): Credit for Kinesiology 311 and 211 will not be allowed.

Kinesiology 321 **3 units; H(3-0)**

Foundations of Instruction
The fundamental principles of creating an effective learning environment in an instructional activity setting.

Prerequisite(s): Kinesiology 201 and admission to the Leadership in Pedagogy and Coaching major.

Kinesiology 323 **3 units; H(3-2)**

Integrative Human Physiology
This course builds upon fundamental principles of human systems physiology, with a focus on how the integration of these physiological systems provides the means by which our bodies maintain homeostasis from the systemic down to the cellular level.

Prerequisite(s): Kinesiology 260 and admission to the Faculty of Kinesiology.

Antirequisite(s): Credit for Kinesiology 323 and any of Biology 305, Medical Science 404, Zoology 269, 461, or 463 will not be allowed.

Kinesiology 330 **3 units; H(2-2)**

Flexibility and Relaxation Techniques
Study of joint flexibility, relaxation techniques, and stress management and their importance to physical fitness, human performance, wellness, and health.

Prerequisite(s): Kinesiology 260 or Zoology 269.

Kinesiology 331 **3 units; H(3-0)**

Foundations of Coaching
The fundamental principles of creating an effective training environment for the developing athlete.

Prerequisite(s): Kinesiology 201.

Kinesiology 335 **3 units; H(2-2)**

Active Living Outdoors
Emphasizing a "fit-for-life" philosophy, this course explores the health providing benefits of selected self-propelled outdoor activities. Students are required to participate in activity experiences on campus.

Prerequisite(s): Kinesiology 203.

Note: Students may incur additional costs for equipment rental.

Kinesiology 339 **3 units; H(3-0)**

Natural Environments, Wellness, and Health
An exploration of how physical activity in natural, outdoor environments leads to enhanced physical fitness, wellness, and health. Safe practices in these environments will be examined in conjunction with practices that help maintain the ecological integrity of natural and wild environments.

Prerequisite(s): Kinesiology 203.

Kinesiology 343 **3 units; H(3-0)**

Canadian Sport History
The sources and development of sporting activity in Canadian society.

Prerequisite(s): One of Kinesiology 244, 245 or 303.44.

Kinesiology 344 **3 units; H(3-0)**

Gender, Sexuality, and Sport
Informed by feminist theoretical perspectives, exploring the different ways that sport functions to reproduce and challenge dominant ideas about gender and sexuality.

Prerequisite(s): One of Kinesiology 244, 245 or 303.44 and admission to the Faculty of Kinesiology.

Kinesiology 351 **3 units; H(3-0)**

Cognition and Learning in Human Movement
An examination of cognitive science and its contribution to understanding human movement. The emphasis will be placed on enhancing learning and performance in physical activity and sport.

Prerequisite(s): Kinesiology 251.

Kinesiology 355 **3 units; H(3-0)**

Human Growth and Development
The physiological, anatomical, emotional and social changes in human growth and development, with a view to the planning and selection of appropriate programs in physical education, sport, and dance.

Prerequisite(s): Kinesiology 260.

Corequisite(s): Prerequisite or Corequisite: Kinesiology 323.

Kinesiology 363 **3 units; H(3-1/4)**

Biomechanics of Biological Materials
Functional characteristics of muscle, bone, cartilage, tendon, ligament, and joints as they relate to movement and loading of the locomotor system.

Prerequisite(s): Kinesiology 263 and Statistics 205 or 213.

Kinesiology 367 **3 units; H(2-1T-1)**

Adapted Physical Activity
An examination of specific problems within the psychomotor domain and the related delivery systems for their identification and amelioration.

Prerequisite(s): Kinesiology 260.

Note: Laboratory consists of a required practicum.

Kinesiology 369 **3 units; H(3-0)**

Physical Activity, Health, and Aging
Aging and its impact on neuromotor performance, fitness, health, and patterns of participation in physical activity and recreational pursuits.

Corequisite(s): Prerequisite or Corequisite: Kinesiology 355.

Kinesiology 371 **3 units; H(3-2)**

Scientific Basis of Prevention and Care of Athletic Injuries
Responsibilities of physical educators with respect to their role in the prevention and care of athletic injuries.

Prerequisite(s): Kinesiology 260 and admission to the Faculty of Kinesiology.

Kinesiology 372 **3 units; H(3-1/3)**

Foundations of Sport Medicine
An introduction to the common medical issues and injuries that affects the athlete related to sport and exercise.

Prerequisite(s): Kinesiology 260 and admission to the Faculty of Kinesiology.

Kinesiology 373 **3 units; H(3-3)**
(formerly Kinesiology 473)

Exercise Physiology
The physiology of muscular exercise, physical conditioning, and training. The course will cover aspects of the nervous, muscular, cardiovascular, and respiratory systems and also present the material in the context of the effects of exercise on an integrated system. Short- and long-term adaptations to exercise will be examined relative to health and human activity.

Prerequisite(s): Kinesiology 203, 213, 323 and admission to the Faculty of Kinesiology.

Note: Students are responsible for completing a Physical Activity Readiness Questionnaire (PAR-Q & You / PAR-Q+) and obtaining a medical clearance if required.

Kinesiology 375 **3 units; H(2-2/2)**

Tests and Measurements in Kinesiology
Establishment of tests, criteria for selection of tests, measurement devices used to evaluate physiological status, human growth, and skill levels in physical activity programs.

Prerequisite(s): Kinesiology 203 and 213 and admission to the Faculty of Kinesiology.

Note: Students are responsible for completing a Physical Activity Readiness Questionnaire (PAR-Q & You / PAR-Q+) and obtain medical clearance if required.

Kinesiology 381 **3 units; H(2-2)**

Computer Applications in Kinesiology
An introduction to the use of the computer in kinesiology which involves hands-on experiences with selected software packages.

Kinesiology 391 **3 units; H(1-3)**

Practicum I
Practical experiences with children and youth in instructional programs of physical activity.

Prerequisite(s): Kinesiology 321 and admission to the Leadership in Pedagogy and Coaching program.

Note: Students must consult with the Leadership in Pedagogy and Coaching Co-ordinator in order to obtain required documentation to comply with the legal requirements for placement in schools.

NOT INCLUDED IN GPA

Kinesiology 393 **1.5 units; Q(2-2)**

Research Seminar I
Students attend, discuss, and critique a series of research seminars in the Human Performance Laboratory.

Prerequisite(s): Kinesiology 213 and 263 and admission to the Faculty of Kinesiology.

NOT INCLUDED IN GPA

Kinesiology 395 **1.5 units; Q(2-2)**

Research Seminar II
Students attend, discuss, and critique a series of research seminars in the Human Performance Laboratory.

Prerequisite(s): Kinesiology 393.

NOT INCLUDED IN GPA

Kinesiology 397 **3 units; H(3-0)**

Health and Exercise Psychology
An examination of psychological issues related to health, exercise, and physical activity.

Prerequisite(s): Kinesiology 253 and admission to the Faculty of Kinesiology.

Kinesiology 399 **3 units; H(3-0)**

Sport Psychology
An analysis of personality and social psychological variables affecting the athlete/coach in the context of sport.

Prerequisite(s): Kinesiology 253 and admission to the Faculty of Kinesiology.

Kinesiology 403 **3 units; H(3-0)**

Health Promotion
Exploration of the relationships between health, disease, and the benefits associated with physical activity and the various factors that can promote and maintain healthy lifestyle change.

Prerequisite(s): Kinesiology 321 and admission to the Leadership in Pedagogy and Coaching program.

Kinesiology 420 **15 units**

Work Term in Kinesiology
Extensive unpaid work term focused on experiential learning in the field of kinesiology. Students must spend a total of 35-40 hours per week for 12-13 weeks in a workplace setting.

Prerequisite(s): 84 units (14 full-course equivalents) completed and consent of the Faculty.

Note: This course carries a weight of 15 units (2.5 full-course equivalents).

NOT INCLUDED IN GPA

Kinesiology 431 **3 units; H(2-2)**

The Art of Coaching
Advanced principles of the art of effective coaching.

Prerequisite(s): Kinesiology 331 and admission to the Leadership in Pedagogy and Coaching program.

Kinesiology 433 **3 units; H(3-0)**

Health and Physical Activity
Exploration of the relationships between health, disease, and the benefits associated with physical activity and the various factors that can promote and maintain lifestyle change. Students will be required to complete a personal health report based on the following laboratory components: (1) blood lipid profile (a fasting blood draw), (2) nutritional record (dietary record analyzed), (3) health risk analysis (an online risk assessment) and risk factor concept (summary 1 - 3 with the inclusion of family/genetic background).

Prerequisite(s): Kinesiology 323.

Kinesiology 435 **3 units; H(3-0)**

Volleyball Coaching Theory
Prerequisite(s): Kinesiology 331 and consent of the Faculty.

Kinesiology 437 **3 units; H(3-0)**

Advanced Nutrition
An examination of current nutritional strategies for sport performance and diet-related chronic diseases. Critical analysis of a wide variety of dietary supplements will be included.

Prerequisite(s): Kinesiology 237 and 373.

Kinesiology 441 **3 units; H(0-4)**

Practicum A
Unpaid practicum placement focused on experiential learning in the field of Kinesiology. Students are required to complete 60 to 72 hours in a workplace setting, distributed evenly over the duration of the term.

Prerequisite(s): 60 units (10 full-course equivalents) completed, admission to the Faculty of Kinesiology and consent of the Faculty.

NOT INCLUDED IN GPA

Kinesiology 443 **3 units; H(0-4)**

Practicum B
Practicum placement in kinesiology or related field.

Prerequisite(s): Kinesiology 441 and consent of the Faculty.

NOT INCLUDED IN GPA

Kinesiology 444 **3 units; H(3-0)**

Critical Perspectives on the Body
Critical considerations of the relationship between the body and historical, cultural, and political context.

Prerequisite(s): Kinesiology 344.

Kinesiology 445 **3 units; H(0-4)**

Practicum C
Practicum placement in kinesiology or related field.

Prerequisite(s): Kinesiology 443 and consent of the Faculty.

NOT INCLUDED IN GPA

Kinesiology 451 **3 units; H(3-0)**

Advanced Topics In The Neuro-Psychology of Human Movement
Students will have an opportunity to carry out a quiet eye research "pilot" project in a sport, medical or other task, that has been approved by the instructor.

Prerequisite(s): Kinesiology 351 and admission to the Faculty of Kinesiology.

Kinesiology 460 **3 units; H(0-4)**

Laboratory Practicum: Anatomy
Detailed planning and anatomical dissection of human cadavers.

Prerequisite(s): Kinesiology 260, admission to the Faculty of Kinesiology and consent of the Faculty.

Antirequisite(s): Credit for Kinesiology 460 and 593.61 will not be allowed.

NOT INCLUDED IN GPA

Kinesiology 463 **3 units; H(3-1)**

Advanced Techniques in Biomechanics
Exploring basic concepts of analysis and modelling in biomechanics, including numerical implementation and solution.

Prerequisite(s): Kinesiology 363 and admission to the Faculty of Kinesiology.

Kinesiology 465 **3 units; H(3-0)**

Adaptation to Environmental Stress
Physiological effects of temperature and humidity fluctuations; principles of heat generation, conservation and transfer; acute and chronic effects of hypo and hyperbarometric pressures; special dietary considerations; and associated physio-psychological implications will be examined.

Corequisite(s): Prerequisite or Corequisite: Kinesiology 323.

Kinesiology 466 **6 units; F(0-6)**

Biomechanics Research Project
A capstone course where students assimilate their knowledge by designing and conducting a biomechanics research project.

Prerequisite(s): Kinesiology 363 and 393 and admission to the Biomechanics major.

Corequisite(s): Prerequisites or Corequisites: Kinesiology 395 and 463.

Kinesiology 469 **3 units; H(3S-0)**

Topics in Sport Medicine
An examination of current medical topics in sport medicine as they relate to the athlete. The topics will include common medical problems and drugs in sport.

Prerequisite(s): Kinesiology 323 and one of 371 or 372 and admission to the Faculty of Kinesiology.

Kinesiology 475 **3 units; H(3-0)**

Physiology of Athletic Performance
The physiological factors and principles of training affecting performance will be reviewed and challenged on the scientific basis of experimental evidence.

Prerequisite(s): Kinesiology 373.

Kinesiology 479 **3 units; H(3-3)**

Advanced Fitness Appraisal and Exercise Prescription
Advanced knowledge and skills necessary to assess physical fitness status of apparently healthy individuals, including cardiorespiratory fitness, muscular strength and endurance, body composition, and flexibility. Interpretation of fitness test results, development of appropriate exercise prescriptions, and communication skills necessary for effective counselling.

Prerequisite(s): Kinesiology 373 and consent of the Faculty.

Note: Students are responsible for completing a Physical Activity Readiness Questionnaire (PAR-Q & You / PAR-Q+) and obtain medical clearance if required.

Kinesiology 485 **3 units; H(3-0)**

Skeletal Muscle Properties
The structural organization, neural control, contractile consequences, and determinants of energy cost of contraction of skeletal muscle will be studied in detail.

Prerequisite(s): Kinesiology 373.

Kinesiology 487 **3 units; H(3-0)**

The Olympic Games
A critical analysis of the modern Olympic Games.

Kinesiology 490 **6 units; F(3-0)**

Interpretation of Research and Research Project
Prerequisite(s): Statistics 205 or 213, admission to the Kinesiology Honours program and consent of the Faculty.

Kinesiology 491 **3 units; H(1-3)**

Practicum II
Additional practical experiences with children and youth in instructional programs of physical activity.

Prerequisite(s): Kinesiology 391 and admission to the Leadership in Pedagogy and Coaching program and consent of Pedagogy Co-ordinator.

Note: Students must consult with the Leadership in Pedagogy and Coaching Co-ordinator in order to obtain required documentation to comply with the legal requirements for placement in schools.

NOT INCLUDED IN GPA

Kinesiology 493 **3 units; H(3-0)**

Epidemiology of Health and Physical Activity
An examination of physical activity/disease relationships through application of population-based methods including research design and interpretation of studies. The content will assist the student in identifying the quality and extent of research supporting the relationships between health, disease, and habitual physical activity and fitness.

Prerequisite(s): Kinesiology 433 and 373.

Kinesiology 495 **3 units; H(3-0)**

Physiological Aspects of Aging, Disease, and Physical Activity
An examination of the interaction between aging, age-associated disease (e.g., cardiovascular disease) and physical activity. The major emphasis will be on the physiological processes involved.

Prerequisite(s): Kinesiology 355 and 373.

Kinesiology 497 **3 units; H(3-0)**

Cancer and Exercise Research and Reviews
Examination of current literature and issues in cancer and exercise research.

Prerequisite(s): Kinesiology 397 and admission to the Faculty of Kinesiology.

Antirequisite(s): Credit for Kinesiology 497 and 503.07 will not be allowed.

Kinesiology 499 **3 units; H(3-0)**

Applied Sport Psychology
Focus on applied sport psychology techniques and strategies to optimize performance, with the intent to bridge sport psychology related research with professional practice.

Prerequisite(s): Kinesiology 399 and admission to the Faculty of Kinesiology.

Kinesiology 503 **3 units; H(3-0)**

Special Topics in Kinesiology
An examination of selected special topics in kinesiology and related subjects.

Prerequisite(s): Admission to the Faculty of Kinesiology and consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Kinesiology 569 **3 units; H(3-1)**

Rehabilitation Through Recreational Activities
Issues of planning and implementing recreation, health, and wellness programs for persons with disability including advocacy, planning principles, creativity, learning techniques, and teamwork.

Prerequisite(s): Admission to the BCR program or Kinesiology 367.

Kinesiology 591 **3 units; H(0-4)**

Practicum
Prerequisite(s): Admission to the Faculty of Kinesiology and consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Kinesiology 593 **3 units; H(0-4)**

Senior Practicum
An opportunity for students to gain personalized, applied research and/or work experience in kinesiology or related fields.

Prerequisite(s): Admission to the Faculty of Kinesiology and consent of the Faculty.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Graduate Courses

Kinesiology 603 **3 units; H(3-0)**

Special Topics
Intensive study of selected topics in human physical activity and related subjects as follows: Applied Sport Psychology; Biomechanics; Cognitive Science: Vision and Motor Behaviour; Exercise and Health Physiology; Health and Exercise Psychology; Motor Learning; Multi-Media Applications in Learning; Neuro-Motor Psychology; Nutrition, Metabolism and Genetics; Sport and Exercise Psychology; Sport History; Sport Medicine; Sport Sociology.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

MAY BE REPEATED FOR CREDIT

Kinesiology 605 **1.5 units; Q(2S-0)**

Nutrition for Performance and Active Living
Nutritional requirements for sport performance and active living, including an overview of basic nutritional principles. Designed to use current research findings as a basis to examine the role of nutrition in sport performance. Nutrition for an active lifestyle will also be examined.

Prerequisite(s): Admission to Graduate Program in Kinesiology.

Kinesiology 606 **6 units; F(3T-3)**

Practical Skills for Applied Exercise Physiology
To develop practical skill and techniques associated with applied exercise physiological measurement vs. measurements in the areas of body composition, cardiorespiratory and musculoskeletal fitness.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 609 **3 units; H(3-1T)**

Statistical Techniques in Kinesiology
Basic concepts of statistical analysis as they apply to research methods used in various disciplines in kinesiology.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Antirequisite(s): Credit for Kinesiology 609 and 603.84 will not be allowed.

Kinesiology 611 **3 units; H(3-0)**

Research Methods in Kinesiology
An overview of research methods including study design, data collection, measurement, interpretation of data, scientific writing, and critical appraisal of the literature relevant to kinesiology.

Prerequisite(s): One graduate course in Biostatistics or Statistics (including Kinesiology 609, Medical Science 643.01, Psychology 614, or equivalent) and admission to a Graduate Program in Kinesiology.

Kinesiology 615 **1.5 units; Q(2S-0)**

Seminar in Applied Exercise Physiology I
Lectures and seminar presentations, discussion and critique of current research in applied exercise physiology and related subjects.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 617 **1.5 units; Q(2S-0)**

Seminar in Applied Exercise Physiology II
Lectures and seminar presentations, discussion and critique of current research in applied exercise physiology and related subjects. Focus on chronic disease.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 637 **3 units; H(3-0)**

Nutrition for Physically Active Populations
The nutritional requirements of specific athletic and/or physically active groups such as cardiac rehabilitation patients and child athletes.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 663 **3 units; H(3-1/2)**
(Mechanical Engineering 663)
(Medical Science 663)

Advanced Muscle Mechanics and Physiology
A look at problems associated within muscle mechanics and contractility. Also the use of muscle mechanics as a scientific discipline to critically learn and evaluate the scientific process. Basic anatomy and physiology of muscle contraction including the cross-bridge theory, and the force-length, force-velocity and force-time relationships

of actively and passively contracting muscles will also be covered.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 673 **3 units; H(3-3)**

Exercise Physiology
Topics in exercise physiology will include the effects of exercise on muscle, metabolism, hormones, respiration, and the cardiovascular system. Nutrition, body composition, ergogenic aids, and environmental factors will also be examined.

Prerequisite(s): Kinesiology 373 and admission to a Graduate Program in Kinesiology.

Kinesiology 690 **6 units; F(1T-8)**

Practicum
The practicum will consist of multiple experiences in applied physiology environments.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

NOT INCLUDED IN GPA

Kinesiology 697 **1.5 units; Q(2S-0)**

Exercise and Sport Psychology
Addresses the determinants and consequences of exercise and sport engagement within clinical and athletic populations. The focus will be on the translation of research to practice, with hands-on skills and effective practice guidelines shared with the students.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 703 **3 units; H(3-0)**

Special Topics
Intensive study of selected topics in Kinesiology as follows: Applied Sport Psychology; Biomechanics; Exercise and Health Physiology; Health and Exercise Psychology; Motor Learning; Multi-Media Applications in Learning; Neuro-Motor Psychology; Nutrition, Metabolism and Genetics; Physiology of Skeletal Muscle; Sport and Exercise Psychology; Sport History; Sport Medicine; Sport Sociology.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

MAY BE REPEATED FOR CREDIT

Kinesiology 715 **1.5 units; Q(2S-0)**

Seminar in Applied Exercise Physiology III
An advanced level of presentation and critical appraisal of research in applied physiology. Students will assume a leadership role in a seminar setting.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 717 **1.5 units; Q(2S-0)**

Seminar in Applied Exercise Physiology IV
An advanced level of presentation and critical appraisal of research in applied physiology. Students will assume a leadership role in a seminar setting.

Prerequisite(s): Admission to a Graduate Program in Kinesiology.

Kinesiology 773 **3 units; H(3-3)**

Integrative Exercise Physiology
The effects of exercise on the complex physiological interactions between different systems in the human body.

Prerequisite(s): Kinesiology 673 and admission to a Graduate Program in Kinesiology.

Kinesiology 775 **3 units; H(3-3)**

Clinical Exercise Physiology
Exercise for clinical populations: exercise assessment and prescription for disease modification.

Prerequisite(s): Kinesiology 773 and admission to a Graduate Program in Kinesiology.

Kinesiology 785 **3 units; H(3-3)**

Training Strategies for Health and Sport
The science of improving health and athletic performance with appropriate periodized stress and recovery.

Prerequisite(s): Kinesiology 773 and admission to a Graduate Program in Kinesiology.

Language LANG

Instruction and services offered by the Departments of French, Italian and Spanish and Linguistics, Languages, and Culture in the Faculty of Arts and the Werklund School of Education.

For program information please contact one of the Faculty of Arts or Werklund School of Education.

Senior Course

Language 599 **3 units; H(3-0)**

Topics in the Study of Language
Topics will reflect developments in current research in second language acquisition and learning will vary from session to session and will be announced in advance.

Prerequisite(s): Consent of the home department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Language 605 **3 units; H(3-0)**

Second Language Learning and Pedagogy
Theoretical and practical overview of the processes involved in acquiring a second language, with a focus on naturalistic language acquisition and on classroom strategies and classroom language learning.

Prerequisite(s): Consent of the home department.

Language 615 **3 units; H(3-0)**

Second Language Learning and Technology
Theoretical and practical aspects of incorporating technology into the language classroom. A general overview in the context of theories of second language acquisition of using the web, electronic mail, online chat discussion, and videoconferencing as tools in language teaching/learning; students will also learn to create their own websites and web activities for teaching.

Prerequisite(s): Consent of the home department.

Language 625 **3 units; H(3-0)**

Second Language Learning and Cultural Understanding
An introduction to the interdisciplinary nature of "culture" as it pertains to second language teaching and learning.

Prerequisite(s): Consent of the home department.

Language 699 **3 units; H(3-0)**

Research Seminar in Second Language Learning
Centred round a professor's current research project, the course will engage students as members of a collaborative research team that will serve as a practical exposure to research methods in the area of second language learning and acquisition.

Prerequisite(s): Consent of the home department.

MAY BE REPEATED FOR CREDIT

Latin LATI

Instruction offered by members of the Department of Classics and Religion in the Faculty of Arts.

Note: For courses in Latin Literature in translation, Roman History, Art, Archaeology, etc., see Greek and Roman Studies.

Note on Sequence and Prerequisites: The normal sequence is Latin 201, 203, 301, 303, 401 and/or 403, 551. Latin 205, 207 are alternatives to Latin 201, 203, and are designed primarily for Science and Engineering students.

Junior Courses

Latin 201 **3 units; H(4-1T)**

Latin I
This course for beginners provides the first steps towards reading Latin texts.

Latin 203 **3 units; H(4-1T)**

Latin II
Continuation of Latin 201.

Prerequisite(s): Latin 201 or 205.

Latin 205 **3 units; H(4-0)**

The Latin of Science I
An introduction to Latin through ancient, medieval and modern scientific texts, designed for students in the Sciences and Engineering.

Note: Credit for Latin 205 and 201 will not be allowed.

Latin 207 **3 units; H(4-0)**

The Latin of Science II
Continuation of Latin 205.

Prerequisite(s): Latin 205 or 201.

Note: Credit for Latin 207 and 203 will not be allowed.

Senior Courses

Latin 301 **3 units; H(3-0)**

Latin III
Completes the study of basic grammar, vocabulary and translation skills.

Prerequisite(s): Latin 203 or 207.

Latin 303 **3 units; H(3-0)**

Intermediate Readings in Classical and Post-Classical Texts
Prerequisite(s): Latin 301.

Latin 401 **3 units; H(3-0)**

Readings in Latin Prose
Readings will normally be selected according to genres, such as Historiography, Oratory, Philosophic and Didactic Prose, the Novel, Epigraphy.

Prerequisite(s): Latin 303.

MAY BE REPEATED FOR CREDIT

Latin 403 **3 units; H(3-0)**

Readings in Latin Poetry
Readings will normally be selected according to genres, such as Epic, Drama, Lyric, and Satire.

Prerequisite(s): Latin 303.

MAY BE REPEATED FOR CREDIT

Latin 551 **3 units; H(0-2T)**

Directed Studies in Latin
Readings may be selected from any genre of Latin at an advanced level.

Prerequisite(s): Consent of the Department.

Note: Students in Greek and Roman Studies or Ancient and Medieval History are encouraged to pursue areas such as paleography, epigraphy, and Christian texts.

MAY BE REPEATED FOR CREDIT

Graduate Course

Latin 601 **3 units; H(3S-0)**

Graduate Seminar
MAY BE REPEATED FOR CREDIT

Latin 602 **3 units; H(4-1)**

Introductory Language Class for Graduate Students
Introduction to grammar, vocabulary and translation skills.

MAY BE REPEATED FOR CREDIT

Latin 604 **3 units; H(3-0)**

Intermediate Language Class for Graduate Students
Consolidation of grammar, vocabulary and translation skills.

MAY BE REPEATED FOR CREDIT

Latin 607 **1.5 units; Q(0-1T)**

Directed Studies
MAY BE REPEATED FOR CREDIT

Latin American Studies LAST

Instruction offered by the Department of History in the Faculty of Arts.

Junior Courses

Latin American Studies 211 **3 units; H(3-0)**

Latin America: People, Places and Popular Culture
An introduction to Latin America, one of the most diverse and dynamic regions in the world. What is the origin of this diversity? How does this diversity manifest itself in today's places and cultures? An interdisciplinary approach is taken to answering these questions, as the course material integrates archaeology, history, political science, economics, geography, anthropology, and cultural studies to introduce students to the region.

Antirequisite(s): Credit for Latin American Studies 211 and 201 will not be allowed.

Senior Courses

Latin American Studies 301 **3 units; H(0-3)**

Field Study in Latin America
An experiential learning course, designed to provide a framework for the student's empirical learning experience during the Latin American Studies Field School. Provides a forum for the sharing of cross-cultural experiences among the students, as they analyze and reflect on the realities of life in Latin America. Students will be expected to live with a local family during the Field School, to take an active part in discussions, and to participate in events and field trips.

Prerequisite(s): Consent of the Program Co-ordinator.

Note: Normally offered during the Spring or Summer Intersession.

NOT INCLUDED IN GPA

Latin American Studies 303 **3 units; H(3-0)**

Latin American Field Research
In a Latin American field setting, this course guides students in integrating their own observations and experiences with scholarly readings on themes of relevance and importance to the particular setting. Attention is paid to the archaeological and historical contexts as well as present day economic, political, and social issues of Latin America. The regional and theoretical focus of the material will vary according to the location at which the course is given.

Prerequisite(s): Consent of the Program Co-ordinator.

Note: Normally offered during the Spring or Summer Intersession.

Latin American Studies 311 **3 units; H(3-0)**

Critical Contemporary Issues in Latin America
An analysis of critical issues that provides students with a framework for understanding Latin America today. Examines themes of contemporary importance, which may include human rights, indigenous issues, energy, the environment, democratization, poverty and inequality, social movements, migration, and the region's relationship with the United States.

Antirequisite(s): Credit for Latin American Studies 311 and 203 will not be allowed.

Latin American Studies 401 **3 units; H(3S-0)**

Integrative Seminar in Latin American Studies
An advanced seminar involving research on a special Latin American topic integrating a variety of disciplinary and interdisciplinary perspectives (e.g. political science, anthropology, geography, cultural studies).

Prerequisite(s): Latin American Studies 201 or 211; and 203 or 311, and 48 units (8.0 full-course equivalents).

MAY BE REPEATED FOR CREDIT

Latin American Studies 501 **3 units; H(3-0)**

Directed Study in Latin American Studies
Students devise a research question and carry out a program of independent research with a specialist on a topic in the area of Latin American Studies.

Prerequisite(s): 48 units (8.0 full-course equivalents) and consent of the Program Co-ordinator.

Note: Students must contact the Program Co-ordinator well in advance of the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Law LAW

Instruction offered by members of the Faculty of Law.

For course descriptions and details of the transition from the old to the new curriculum, consult the electronic Faculty of Law Calendar available at law.ucalgary.ca.

First Year Curriculum

All courses are compulsory.

Law 400 **F(3-0)(5 credits)**

Constitutional Law
The basic elements of Canadian constitutional law. The nature of constitutions and constitutional processes; principles of constitutional interpretation; constitutional amendment; Federal-Provincial distribution of legislative powers including the federal general power, natural resources and public property, provincial property and civil rights, trade and commerce, provincial taxation, transportation, communications, and criminal law; the Canadian Charter of Rights and Freedoms including principles of limitation, remedies, interpretation, application, fundamental freedoms, democratic and language rights, mobility rights, legal rights, equality rights, and aboriginal people's rights.

Law 402 **F(3-0)(5 credits)**

Contracts
A legal and policy analysis of the basic principles and fundamental concepts of the law of contracts as they relate to commercial and consumer transactions. The formation of contracts including offer and acceptance, and consideration; estoppel; privity; terms of contract, including exemption clauses; standard form contracts; bailment; mistake, misrepresentation and unconscionability; termination, including the doctrine of frustration; breach and remedies for breach; dispute resolution processes. Emphasis is placed not only on a knowledge of rules and principles, their historical derivation, rationale, efficacy and social validity, but also upon their creative use to both avoid and resolve disputes.

Law 403 **H(3-0)(3 credits)**

Legislation
The fundamentals of the legislative process: policy development, legislative drafting, public bill processes, statutory interpretation. The interaction of law and policy in the development of legislation and statutory interpretation. Substantive law connections are made with other first year courses. The functions of the lawyer within these processes are examined, including issues of professional responsibility. The course is taught through performance-based learning methods with emphasis on drafting.

Law 404 **F(3-0)(5 credits)**

Property
An examination of the fundamental concepts of property law and the types of property interests recognized by Anglo-Canadian law. The historical evolution of property concepts; the basic concepts of possession, ownership and title; estates and other interests in land such as joint and concurrent ownership, easements, covenants, licences, mortgages, future interests and perpetuities; the landlord and tenant relationship; the land titles system of registration of title to land; the social constraints upon property use and disposition; and property rights of aboriginal peoples.

Law 406 **F(3-0)(5 credits)**

Torts
An analysis and critique of the law of torts, primarily the law of negligence, with personal injury as the main focus, although other torts will also be introduced. The nature of tort law and its process; an anatomy of the law of negligence - the nature and extent of liability, defences, remedies, and the assessment of damages; intentional torts; economic torts; strict liability; bailment; the impact of private insurance on the tort system; alternative forms of compensation.

Law 407 **H(4-0)(4 credits)**

Foundations in Law and Justice I
An introduction to: legal methods, systems and institutions; sources of law; legal and judicial reasoning; legal analysis, including case analysis and problem-solving skills; critical perspectives on the law, including legal theory and history; the role of the lawyer in system(s) of laws; access to justice. The course is taught on an intensive basis in the first three weeks of law school to provide students with foundational analytical and critical skills for the subsequent curriculum, and using performance-based learning methods.

Note: This course is graded CR, D or F.

Law 408 **H(4-0)(4 credits)**

Foundations in Law and Justice II
The fundamentals of legal research, writing, communication and advocacy,including: developing research strategies; identification and assessment of legal and non-legal information appropriate to a legal problem or issue;drafting of memorandum and/or facta; oral advocacy, including mooting; legal communication, including client interviewing and counselling. This course is taught on an intensive basis in the first three weeks of winter term using performance-based learning methods.

Law 410 **F(5-0)(5 credits)**

Crime: Law and Procedure
An anatomy of criminal conduct and the law's treatment of it utilizing a limited range of criminal offences. The designation of human conduct as criminal and a consideration of the social, cultural and political forces involved; the development of the criminal process in English common law, its translation to Canada and embodiment in the Criminal Code; the substantive elements of a criminal offence including both the physical and mental elements; the common law and code defences; procedural, tactical, ethical and evidential problems associated with criminal prosecution at both the pre-trial and trial stages; the sentencing process; the position at law of the victim.

Second and Third Year Curricula

Full-time students must take a minimum of 30 credits to a maximum of 36 in each of their second and third years, including a minimum of 12 credits to a maximum of 18 per session.

500-Level Courses

Law 503 **H(3-0)(3 credits)**

Administrative Law
This course introduces students to the general structure of administrative decision-making in Canada: how public administrators obtain power and how that power is exercised both at the level of individual adjudication and at the level of the establishment of public policy. It also introduces students to the checks which courts place on the exercise of administrative power. The course discusses the procedures that courts require of administrative agencies and public officials as well as the substantive grounds on which courts may review the decisions of administrative agencies and public officials.

Law 505 **H(3-0)(3 credits)**

Civil Procedure
A detailed examination of issues which arise in the progress of a civil action from first meeting the client through to judgment in the Alberta Court of Queen's Bench. The Alberta Rules of Court are set in the context of the values underlying them. What sort of civil litigation system do we want? What sort of system do we in fact have? Particular attention if paid to the linkages between the apparently discrete components of the process as set out in the Rules, linkages at the levels of both the underlying values and of actual practice. The use of procedures under the Rules to anticipate and resolve evidence problems that might arise at trial is stressed. Interprovincial and international aspect of the civil litigation process are also considered.

Law 507 **H(3-0)(3 credits)**

Evidence
An examination of the fundamental concept of evidence law, including the traditional rules as compared to the emerging principled approach, and such core and primary topics as: the adversary system; relevance and discretionary exclusion; privilege; burdens of proof; character evidence; judicial notice; competence and compellability; examination of witnesses; hearsay; opinion evidence.

Law 508 **H(4-0)(4 credits)**

Negotiation: Selected Topics
Instruction in dispute resolution theory and practice with a focus on negotiation, mediation and topics such as collaborative law and judicial dispute resolution, and application of those processes to a substantive area of law. Taught in a three week intensive format through performance-based learning methods. Evaluation will include a mock negotiation and written exercises such as the preparation of a client-advising memo in the substantive area.

Note: This course is graded CR, D or F.

MAY BE REPEATED FOR CREDIT

Law 509 **H(3-0)(3 credits)**

Business Associations
The common forms of business organization, including the law of agency, partnerships, limited partnerships, and societies and corporations, with a focus on the corporation and the rights and responsibilities of shareholders and directors. Topics will include fiduciary relationships in a commercial context.

Law 510 **H(3-0)(3 credits)**

Ethical Lawyering
An introduction to issues of legal ethics and professional responsibility. Students should become competent at ethical reasoning in the context of legal practice. To achieve this goal the course covers selected topic in the "law of lawyering" (e.g. the Law Society of Alberta's Code of Professional Conduct) but also address the general question of what it means to be an ethical lawyer. Students are expected to develop their awareness of the various moral values underlying the legal system, and to practice how to weigh and apply those values, and the law of lawyering, to ethical problems. The course also covers selected topics relating to the regulation of lawyers' ethics.

Law 511 **H(3-0)(3 credits)**

Criminal Process
A survey and critical examination of core aspects of criminal process law. A focus on legislation relating to jurisdiction and modes of trial including obligations of and options available to prosecution and accused. Other topics include arrest, search and seizure, investigative detention, and right to counsel and silence, all within the context of the Charter of Rights and Freedoms.

Law 515 **H(3-0)(3 credits)**

Family Law
An analysis of the legal principles affecting the rights and responsibilities of the members of the family. Topics include constitutional issues, marriage, marriage contracts, common law marriage, child neglect and abuse, custody and access, guardianship, adoption, separation, divorce, nullity, spousal and child maintenance, and matrimonial property. Stress is placed on the process of family law and the appropriate role for lawyers and judges.

Law 519 **H(3-0)(3 credits)**

Jurisprudence
A critical inquiry into the nature and functions of law and justice, including natural law, legal positivism, sociological jurisprudence, legal realism, and contemporary theorists.

Law 521 **H(3-0)(3 credits)**

Real Estate Transactions
An examination of the estate transactions. Topics include the purchase and sale of property, mortgaging and other ways to finance land transactions, commercial leasing arrangements, and the Land Titles Act as it relates to land development.

Law 525 **H(3-0)(3 credits)**

Bankruptcy and Restructuring Law
Receivership, consumer and commercial arrangements and bankruptcy under the Bankruptcy Act and the Company Creditors Arrangements Act.

Law 527 **H(3-0)(3 credits)**

Basic Tax Law
The basic language and concepts of taxation and identification of taxation issues. Topics include the unit of taxation, the meaning and taxation of income, taxation of benefits, the type and scope of deductions available for business income, and the taxation of capital gains including gains (and losses) on taxpayer assets.

Law 529 **H(3-0)(3 credits)**

Biotechnology and the Law
The legal, ethical, and policy issues relating to biotechnology. Topics include genetically modified foods, animals and plants, synthetic genomics, animal-human combinations, xenotransplantation, human cloning, pharmacogenetics, biofuels, assisted human reproduction, stem cells, tissue engineering, genetic therapy, and genetic enhancement.

Law 530 **3 units; H(3-0)**

Mining Law
The law governing the exploration, financing and development of minerals in Canada. Topics include mining legislation; title; aboriginal rights, including the duty to consult; environmental obligations; mining agreements; and, international transactions

Law 531 **H(3-0)(3 credits)**

Environmental Law
Legal theories, concepts, principles, and processes relevant to environmental protection. Topics include ecological and ethical dimensions, jurisdictional issues, common law rights and remedies, environmental assessment, public participation, contaminated sites, enforcement and compliance, economic approaches, endangered species and protected spaces, land use planning, and environmental dispute resolution.

Law 533 **H(3-0)(3 credits)**

Wills and Estates
The preparation, execution, interpretation, and administration of wills; testamentary capacity; alteration, revocation and republication of wills; intestate succession; dependants' relief; and estate administration.

Law 535 **H(3-0)(3 credits)**

Secured Transactions
The modern law of secured transactions and the financing of personal property, with a focus on Alberta's Personal Property Security Act. Other topics include Bank Act security, the Farm Implement Act, and the Fair Trading Act.

Law 536 **3 units**

International Criminal Law
The law related to international and transnational crimes. Topics may include crimes against humanity, war crimes, genocide, aggression, extradition, terrorism, human trafficking, drug trafficking, cybercrime, state sovereignty and impunity, money laundering, and organized crime.

Law 537 **H(3-0)(3 credits)**

Sale of Goods
The sale and supply of goods, including an examination of the provincial Sale of Goods Act, consumer protection issues, and the Vienna International Sales Convention.

Law 543 **H(3-0)(3 credits)**

Intellectual Property Law
Intellectual property, including the law of patents, copyrights, and trade-marks.

Law 547 **H(3-0)(3 credits)**

Human Rights Law
A survey of national and provincial human rights laws and practice as distinct from the Charter of Rights and Freedoms, and an introduction to the main international and transnational human rights instruments and standards.

Law 549 **H(3-0)(3 credits)**

International Law
The elements of public international law, including sources, the role of customary law, the law of treaties, recognition, state responsibility, and the roles and powers of international organizations.

Law 551 **H(3-0)(3 credits)**

Unjust Enrichment
Unjust enrichment as an independent source of legal obligation. Topics include elements of the right of action and defences; restitution as the remedy, with particular emphasis on personal versus proprietary restitution; and disgorgement of wrongful gain, distinguished from restitution using breach of fiduciary obligation as the primary example.

Law 553 **H(3-0)(3 credits)**

Insurance Law
The various types of insurance (e.g. fire, life, sickness and accident, motor vehicle, and liability). Topics include the nature and formation of the insurance contract, the role of insurance agents, insurable interest, misrepresentation and non-disclosure, and the rights of third parties against the insurer.

Law 557 **H(3-0)(3 credits)**

Commercial Arbitration Law
Private (between individuals) and mixed (investor/state) arbitration. Coverage includes domestic and international arbitration rules, including UNCITRAL and International Centre for the Settlement of Investment Disputes (ICSID) rules.

Law 559 **H(3-0)(3 credits)**

Critical Legal Theories
An examination of critical theoretical perspectives on the nature and functions of law, and of the possibilities and limitations of law as a strategy for social change. Perspectives may include feminist legal theories, critical race theories, post-colonial theories, Aboriginal legal theories, critical disability theories, queer theories, and postmodernism.

Law 561 **H(3-0)(3 credits)**

Employment Law
The law governing non-unionized workplaces in Canada. Topics include constitutional jurisdiction, defining the employment relationship and employer/employee status, the employment contract, implied rights and obligations, termination, reasonable notice of dismissal, constructive dismissal, cause for summary dismissal, human rights, and employment standards legislation.

Law 563 **H(3-0)(3 credits)**

International Human Rights and Humanitarian Law
International human rights law, covering the main global instruments (such as the International Covenants, as well as the regional human rights systems of the Americas and Europe), with an introduction to the principles and concepts of International Humanitarian Law. Topics include women's human rights, death penalty, massive human rights violations, human rights and counter-terrorism, the rights of the child, the rights of indigenous peoples and minorities, and the role of non-state actors.

Law 565 **H(3-0)(3 credits)**

Internet Law
The Internet as a technology, a place for social interaction, and a marketplace. Topics include Internet governance, network neutrality, end to end and layered principles, the domain name system, peer production and distribution, information security and privacy, ISP regulation, regulation of Internet content, electronic commerce, VOIP regulation, and anti-circumvention law.

Law 567 **H(3-0)(3 credits)**

Law and Economics
An examination of the practical and theoretical implications arising from the application of economic reasoning to law. Topics include the economic method of legal analysis, the scope of its application, and the major critical responses in both traditional legal fields of economic influence (such as tort, contract and corporate law) and more novel areas (such as family and criminal law).

Law 569 **H(3-0)(3 credits)**

Law and Literature
The ways in which literary studies inform law and legal analysis, and the ways in which law and legal themes have informed literature.

Law 571 **H(3-0)(3 credits)**

Oil and Gas Law
The upstream oil and gas industry. Topics include ownership of oil and gas and split estates; coalbed methane; the legal character of the private oil and gas lease; the anatomy of the various clauses of the oil and gas lease; and Crown disposition systems, including the Alberta (conventional and oil sands) and federal legislation and related policy question.

Law 573 **H(3-0)(3 credits)**

Public Lands and Natural Resources Law
The protection, exploitation, and management of Crown-owned lands and renewable and non-renewable natural resources (other than oil and gas, and including forestry, rangeland, minerals, wildlife, fisheries, wilderness, recreational, and heritage). Discussion of the nature of public ownership, public and private values, economic approaches, and inter-jurisdictional management.

Law 575 **H(3-0)(3 credits)**

Remedies
Judicial remedies at common law and equity for tort and breach of contract, including personal injury and property damage. Themes include compensating loss, disgorging gain, and punishing civil wrong; prohibiting and compelling defendant behaviour; loss-based, gain-based, and punitive damages; and injunctions and specific performance.

Law 577 **H(3-0)(3 credits)**

Tax Policy
Principles of tax policy (efficiency, equity, and simplicity) and applications related to income, sales, and payroll taxes. Topics include the economic and distributive effects of taxes, auditing and legal compliance, and political economy.

Law 579 **H(3-0)(3 credits)**

Legal Theory, Selected Topics
Critical examination of the main theoretical writings in a major doctrinal area or group of doctrinal areas, such as private law (tort, contract and unjust enrichment); public law (criminal, Constitutional and administrative law); tort; contract; evidence; property; Constitutional; or criminal law.

MAY BE REPEATED FOR CREDIT

Law 581 **H(3-0)(3 credits)**

Unsecured Creditors' Remedies
The remedies available to the unsecured creditor for the collection of debts and the protections offered to debtors, including prejudgment remedies, garnishment, execution against real and personal property, fraudulent preferences and conveyances, and the regulation of collection and credit agencies.

Law 583 **H(3-0)(3 credits)**

Water Law
Water resources and management, including the historical and current legal and policy frameworks governing surface and groundwater rights. Topics include responses to scarcity, alternative water management models and plans, industrial use and re-use of water, wetlands, protection of aquatic resources, aboriginal water rights, economic

instruments, water as a human right, watershed approaches, and inter-jurisdictional or international issues.

Law 585 **H(3-0)(3 credits)**

Alberta Court of Appeal Moots
The development of appellate advocacy and other lawyering skills in the context of preparation for and participation in the Alberta Court of Appeal Moot, in the areas of criminal law; civil law (contract, property or tort law); and constitutional law.

Prerequisite(s): Consent of the Faculty.

Law 587 **H(3-0)(3 credits)**

Kawaskimhon National Aboriginal Moot
The development of advocacy, consensus building, and other lawyering skills in the context of a non-competitive moot conducted in a circle arrangement and using a moot problem based on contemporary issues in Aboriginal-Government relations. Includes a writing requirement.

Prerequisite(s): Consent of the Faculty.

Law 589 **H(3-0)(3 credits)**

Labour Arbitration Moot
The development of advocacy and other lawyering skills in the context of preparation for and participation in an arbitration conducted under a collective agreement. Includes a writing requirement.

Prerequisite(s): Consent of the Faculty.

Law 591 **H(3-0)(3 credits)**

Provincial Court Clerkships
Placements in the Provincial Court performing research, preparing memoranda, and meeting and discussing with a supervising Judge.

Prerequisite(s): Consent of the Faculty.

Note: This course is graded CR, D or F.

Law 593 **H(3-0)(3 credits)**
(formerly Law 657)

Health Law
The regulation, structure, and financing of the health care system. Topics include licensing and regulation of health care professionals (including medical malpractice claims as a form of regulation); regulation of biomedical research; approval processes for drugs; complementary therapies and medical devices; resource allocation and access to health care; market considerations; privatization and deregulation of health care; and consent and confidentiality.

Law 594 **H(3-0)(3 credits)**
(formerly Law 635)

Aboriginal Law
The law governing the relationship between indigenous peoples and settler society. Topics include recognition of aboriginal laws and custom, self-determination and other applicable principles of international law, self-government, common law recognition of aboriginal title, treaties, the fiduciary duty of the Crown, constitutional entrenchment of aboriginal and treaty rights, application of provincial laws, the Indian Act, land surrenders, and exemptions from seizure and taxation.

Law 595 **H(3-0)(3 credits)**
(formerly Law 609)

Canadian Legal History
Migration of European law in the colonial context and its impact in pre-Confederation Canada (settled and conquered colonies); the role of trading companies, particularly the Hudson's Bay Company; the impact of the United States both before and after Confederation; Confederation and the development of Canadian legal culture and law. Jurisdictions may include British Columbia, Alberta, Ontario, Quebec, and Nova Scotia.

Law 596 **H(3-0)(3 credits)**
(formerly Law 679)

Feminist Legal Theory
A critical inquiry into the nature and function of law from a variety of different perspectives within feminist legal theory. Topics include the role of rights and of legal discourse, and the possibilities and limitations of law as a strategy for social transformation.

Law 597 **H(3-0)(3 credits)**
(formerly Law 665)

International Trade Law
The public law framework for international trade, with emphasis on the WTO and NAFTA. Topics include national treatment, most favoured nation treatment, anti-dumping and countervail actions, and dispute resolution.

Law 598 **H(3-0)(3 credits)**
(formerly Law 643)

Trusts
The concept of the trust and its development in equity and its relationship to other legal concepts. Topics include the various types of trusts; constituting, administering and terminating the trust; trustee duties and powers; variation of trusts; breach of trust; and the doctrine of tracing.

Law 599 **H(3-0)(3 credits)**

Legal Practice, Selected Topics
A variety of subject matters related to the practice of law.

MAY BE REPEATED FOR CREDIT

600-Level Courses

Law 601 **H(3-0)(3 credits)**

Advanced Criminal Law
An in-depth examination of case authorities, primarily through an examination of case authorities, certain concepts in criminal law the understanding of which is essential for a criminal practitioner Topics covered may include mens rea, sexual offences, assault, sentencing, conspiracy, driving offences, and identification.

Law 602 **4 credits; H(4-0)**

Advocacy, Selected Topics
Note: This course is graded CR, D or F.

MAY BE REPEATED FOR CREDIT

Law 605 **H(3-0)(3 credits)**

Oil and Gas Contracts
Selected problems in oil and gas law including industry contracts (pooling, farmout, joint operating, purchase and sale and royalty agreements); fiduciary duties; and title review.

Corequisite(s): Prerequisite or Corequisite: Law 571.

Law 607 **H(2-0)(3 credits)**

Advanced Legal Research
This course builds on legal research instruction in the first year of the program and affords further opportunities to learn and practice research skills. The course provides instruction in research methodology, citation, print and electronic research/databases, covering case law, statute law, texts, periodicals and web-based materials.

Law 612 **H(3-0)(3 credits)**

Advanced Private Law
Advanced issues in private law (property, contract, tort, unjust enrichment and equity), including contemporary controversies over appropriate rights and remedies when different causes of action either converge or intersect.

Corequisite(s): Prerequisite or Corequisite: Law 402, 405 and 551.

Law 613 **H(3-0)(3 credits)**

Conflict of Laws
The doctrines and rules governing legal disputes cutting across provincial or national boundaries. Topics include jurisdiction, distinctions between substantive and procedural rules, the recognition and enforcement of foreign judgments, domicile, proof of foreign law, and the choice of law rules relating to private law (torts, contracts, property, succession and family law).

Law 615 **H(3-0)(3 credits)**

Advanced Civil Procedure
The strategic use of the Alberta Rules of Court in civil proceedings with reference to related legislation and ethical requirements. Topics include commencement of proceedings, interlocutory and ex parte applications, discovery of persons and records, trial preparation, and the roles of the court.

Corequisite(s): Prerequisite or Corequisite: Law 505.

Law 617 **H(3-0)(3 credits)**

Alternative Energy Law: Renewable Energy and Energy Efficiency
The renewable energy and energy efficiency sectors. Topics include federalism, wind, small hydro, solar, biomass etc., energy conservation and demand side management, and access to energy infrastructure.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 618 **H(3-0)(3 credits)**

Corporate Finance Law
Legal aspects of corporate finance transactions, including applicable regulatory frameworks. Topics may include equity and debt financing, secured transactions, asses and/or share purchase and sale agreements, and takeover bids.

Corequisite(s): Prerequisite or Corequisite: Law 509.

Law 619 **H(3-0)(3 credits)**

Estate Planning
Personal dispositions of property, both inter vivos and on death, to achieve estate and succession planning objectives. Topics include trusts, corporations, wills, life insurance, buy-sell arrangements, income splitting, estate freezing, and tax deferral plans.

Corequisite(s): Prerequisite or Corequisite: Law 527.

Law 621 **H(3-0)(3 credits)**

Corporate Governance and Litigation
The principal concepts in corporate governance and their evolution in Canada; the Sarbanes-Oxley Act of 2002 and the related rules of the U.S. Securities and Exchange Commission and the New York Stock Exchange; the securities regulatory response of Canada to the adoption of Sarbanes-

Oxley in the United States; and other current topics in corporate governance.

Corequisite(s): Prerequisite or Corequisite: Law 505 and 509.

Law 623 **H(3-0)(3 credits)**

Environmental Impact Assessment Law
Environmental impact assessment (EIA) law and practice in Canada. Topics include the role of EIA in the regulatory process and as a planning tool, federalism, triggers, equivalency, harmonization, joint assessment, implementation of assessment decisions, adaptive management, strategic environmental assessment, the role of traditional knowledge, and public participation.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 624 **H(3-0)(3 credits)**

Environmental Law and Ethics
The ethical underpinning of environmental law, with a consideration of various views, including the land ethic, deep and shallow ecology, instrumental and utilitarian approaches, and inherent value.

Law 625 **H(3-0)(3 credits)**

Intellectual Property Transactions
Intellectual property transactions and strategies in a variety of industries in energy, information technology, and life sciences. Topics include open source IP, IP governance, management and best practices, valuation, ownership, improvements, co-ownership and collaboration, patent pools and standard setting organizations, software licensing and IT transactions, licensing, infringement management, and warranties.

Corequisite(s): Prerequisite or Corequisite: Law 543.

Law 626 **H(3-0)(3 credits)**

International Development Law
The role of law in promoting social and economic growth, with a focus on the rule of law as an instrument of development and the dialogue between the developed and less developed worlds through international agreements. Topics include the rules of international trade and finance, intellectual property, the environment and natural resources, and the war on terrorism.

Corequisite(s): Prerequisite or Corequisite: One of Law 549, 597 or 563.

Law 627 **H(3-0)(3 credits)**

International Environmental Law
The customary and treaty law rules applicable to global and transboundary environmental issues. Topics include air pollution, climate change, international wildlife law and trade, the international chemicals agreements liability regimes, and shared resources.

Law 628 **H(3-0)(3 credits)**

International Investment Law
Investor protection in customary law and treaties, in particular NAFTA Chapter 11, bilateral investment treaties (BITs), and the Energy Charter; the main disciplines, including national treatment, most favoured nation treatment, fair and equitable treatment, and the rules pertaining to expropriation; soft law norms pertaining to investment; and relevant domestic law, including the Investment Canada Act.

Corequisite(s): Prerequisite or Corequisite: Law 549 or 597.

Law 630 **H(3-0)(3 credits)**

International Petroleum Transactions
International business transactions in the context of the petroleum industry, including the various forms of state agreements; confidentiality agreements; study and bidding agreements; international joint operating agreements; agency agreements; and participation agreements; with attention to the key legal, business and ethical issues raised in negotiations.

Law 631 **H(3-0)(3 credits)**

International Tax Law
The tax implications of both inbound and outbound investment and implications for structuring affiliates, with consideration of international tax treaties and foreign tax credit mechanisms.

Corequisite(s): Prerequisite or Corequisite: Law 527.

Law 634 **H(3-0)(3 credits)**

Law of Species and Spaces
The principal federal and provincial laws governing the management of biological diversity, including protected area legislation and endangered species legislation. Explores the constitutional and common law fundamentals of wildlife law as well as contemporary disputes about species protection, ecosystem-level land management, and game ranch operations.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 636 **H(3-0)(3 credits)**

Municipal Law
The legal position of local governments, including cities and regional governments. Topics include the powers of Municipal Councils and Districts, the duties and responsibilities of elected and appointed municipal officials, conflicts of interest, elections, the regulation and licensing of businesses, proprietary and contractual powers, tort and the public body, subdivision, land use planning, and the role of the courts.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 637 **H(3-0)(3 credits)**

Energy Law
An overview of energy regulation, focusing on competition and pricing. Topics include the theory and process of energy regulation, regulatory jurisdiction, judicial review of energy regulation, regulation of natural gas and electricity prices, market restructuring, and deregulation. The course will familiarize students with the legal issues that arise when the legislature and regulators respond to market failures, and/or protect the public interest, in the provision of natural gas and electricity services.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 641 **H(3-0)(3 credits)**

Oil and Gas and Mining Taxation
The resource regime rules of the Income Tax Act as applied to the oil and gas and mining sectors. Topics include: operations subject to the resource regime; the treatment of property costs and common industry expenditures (i.e. applicable "tax pools" and their characteristics): resource industry "subsidies" (e.g. flow-through share financing, investment tax credits); the avoidance provisions (e.g. the successor rules); and the treatment of foreign operations of a Canadian resident taxpayer.

Corequisite(s): Prerequisite or Corequisite: Law 697.

Law 645 **H(3-0)(3 credits)**

Pollution Control and Waste Management Law
The provincial and federal pollution control regimes for air and water pollution and for the handling, storage, treatment, and disposal of hazardous and non-hazardous wastes. Topics include federalism; regulatory and non-regulatory approaches to pollution from "point" and "non-point" sources; cumulative pollutant loads; the "precautionary" and "polluter pays" principles; and liability for contaminated sites.

Corequisite(s): Prerequisite or Corequisite: Law 503 and 531.

Law 647 **H(3-0)(3 credits)**

Regulatory Theory and the Law
The main theories that explain or justify government regulation, including correction for market failure, political economy or public choice, and deliberative democracy. The relationship between those theories and the development and implementation of regulatory legislation, regulation, and public policy.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 648 **H(3-0)(3 credits)**

Securities Law
The regulation of capital market participants; the issuance of, and trades in, securities of companies, with an emphasis on Alberta and the National Instruments enacted by the Canadian securities regulator; the theory of securities regulation; as well as enforcement and compliance.

Law 650 **H(3-0)(3 credits)**

Business Skills for Lawyers
The non-legal skills required by lawyers working in-house or with business clients. Topics may include reading and analyzing financial statements; understanding cash flow models; business valuation; negotiation; capital markets; crisis management; project management.

Law 653 **H(0-3)(3 credits)**

Directed Research
A supervised research project involving the in-depth examination of a legal problem or area of concern not normally covered in a substantive or procedural course and which provides the basis for an article, research paper, brief, memorial, draft legislation, etc. Admission to this course depends on the availability of supervising faculty.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Law 656 **H(3-0)(3 credits)**

Mergers and Acquisitions
Key legal and financial concepts for mergers and acquisitions. Topics may include structuring transactions, the required legal documentation, securities legislation, director and officer responsibilities, negotiations, financing, defensive tactics, due diligence, employment and other issues.

Law 663 **H(3-0)(3 credits)**

Dispute Resolution Clinical
Interest-based, consensus-building dispute resolution processes to enhance understanding of dispute resolution theory, which will be applied through placements drawing on the mentorship

of lawyers and dispute resolution practitioners engaged in court-annexed or private mediation, facilitation, collaborative law, and other processes.

Corequisite(s): Prerequisite or Corequisite: Law 513.

Note: This course is graded CR, D or F.

Law 667 **H(3-0)(3 credits)**

Advanced Public Law
Selected issues in constitutional law at the advanced level. Topics may include constitutional amendment, comparative approaches to rights, comparative federalism, the role of international law in constitutional interpretation, the legitimacy of judicial review, evidentiary issues in constitutional litigation, the role of social movements, and strategic litigation in securing constitutional rights.

Prerequisite(s): Law 400.

Law 673 **H(3-0)(3 credits)**

Jessup Moot
Preparation for and participation in the Philip C. Jessup International Law Moot Court Competition.

Prerequisite(s): Consent of the Faculty.

Law 674 **H(3-0)(3 credits)**

Business Venture Clinic
A clinical seminar where students work with startup companies and entrepreneurs. Students may prepare memos and drafts of business agreements. Students receive feedback on their written work from practicing lawyers.

Note: This course is graded CR, D or F.

Law 677 **H(3-0)(3 credits)**

Canadian Corporate/Securities Law Moot
The development of appellate advocacy and other lawyering skills in the context of corporate and securities law in Canada.

Prerequisite(s): Consent of the Faculty.

Law 678 **H(3-0)(3 credits)**

The Gale Cup Moot
The development of appellate advocacy and other lawyering skills in the context of preparation for and participation in the national Gale Cup Moot.

Prerequisite(s): Consent of the Faculty.

Law 683 **H(3-0)(3 credits)**

Advanced Family Law
Selected topics in family law, including matrimonial property; division of pensions; international family law; and the law relating to children, including regulatory aspects (e.g. child welfare).

Corequisite(s): Prerequisite or Corequisite: Law 515.

Law 685 **H(3-0)(3 credits)**

Business Clinical
The skills employed by a corporate solicitor in the context of one or more transactions. Skills covered may include drafting, negotiating, research, advocacy, and transaction management, in simulated or real transactions.

Corequisite(s): Prerequisite or Corequisite: Law 509.

Note: This course is graded CR, D or F.

Law 686 **H(3-0)(3 credits)**

Clinical Theory
An opportunity to explore and reflect on what it means to be a good lawyer. Topics include the formation of professional identity and legal, ethical and practical issues in poverty law

Corequisite(s): Law 688.

Law 687 **H(3-0)(3 credits)**

Criminal Justice Clinical
A clinical seminar in elements of criminal law covering topical, practical, and ethical issues in the practice of criminal law. Three short placements with Crown and defence lawyers and a provincial court judge.

Corequisite(s): Prerequisite or Corequisite: Law 511.

Note: This course is graded CR, D or F.

Law 688 **H(3-0)(3 credits)**

Clinical Practice
Advanced experiential learning in a clinic setting. Students learn how to effectively manage clients and files while developing interviewing, counselling and advocacy skills in a variety of areas.

Corequisite(s): Law 686.

Note: This course is graded CR, D or F.

Law 689 **H(3-0)(3 credits)**

Family Law Clinical Seminar
A clinical seminar in elements of family law practice. The clinical experience may be obtained through simulated exercises, supervised handling of files and/or placements. Topics include Chambers advocacy, marital dispute consultations and drafting of a settlement.

Corequisite(s): Prerequisite or Corequisite: Law 515.

Note: This course is graded CR, D or F.

Law 690 **H(3-0)(3 credits)**

Western Canada MacIntyre Cup Trial Competition
The development of trial advocacy and other lawyering skills in the context of preparation for and participation in the Western Canada Trial Competition. Credit for this competition does not preclude credit for the Sopinka Cup.

Prerequisite(s): Consent of the Faculty.

Law 691 **H(3-0)(3 credits)**

Natural Resources, Energy and Environmental Law Clinical
A clinical seminar involving placements in any one of the following practice areas: energy law, resources law, water law, and environmental law.

Corequisite(s): Prerequisite or Corequisite: One of Law 531, 571, 573, 583 or 637.

Note: This course is graded CR, D or F.

Law 692 **H(2-0)(2 credits)**

Selected Topics I
A variety of subject areas, either doctrinal or theoretical.

MAY BE REPEATED FOR CREDIT

Law 693 **H(3-0)(3 credits)**

Selected Topics II
A variety of subject areas, either doctrinal or theoretical.

MAY BE REPEATED FOR CREDIT

Law 694 **H(4-0)(4 credits)**

Selected Topics III
A variety of subject areas, either doctrinal or theoretical.

MAY BE REPEATED FOR CREDIT

Law 695 **H(3-0)(3 credits)**

External Competitions
The development of advocacy and other lawyering skills in the context of preparation for and participation in an external competition not otherwise the subject of a course. A written component is generally required.

Prerequisite(s): Consent of the Faculty.

Law 696 **H(3-0)(3 credits)**

Clinical Studies
Participation in a clinical experience not otherwise the subject of a clinical course.

Prerequisite(s): Consent of the Faculty.

Note: This course is graded CR, D or F.

Law 697 **H(3-0)(3 credits)**

Corporate Tax
The provisions of the Income Tax Act applicable to corporations and their shareholders. Topics include the classification of corporations for tax purposes, the taxation of corporate income, the taxation of corporate distributions, and the taxation of various types of corporate reorganizations.

Corequisite(s): Prerequisite or Corequisite: Law 509 and 527.

Law 698 **H(3-0)(3 credits)**
(formerly Law 539)

Immigration and Refugee Law
Basic principles, policies, and procedures governing immigration and refugee law. Topics include refugee law and status; selection and admission of immigrants; inadmissible and removable classes; exemptions and minister's permits; and appeals and judicial review in the federal court, including Charter issues.

Corequisite(s): Prerequisite or Corequisite: Law 503.

Law 699 **H(3-0)(3 credits)**
(formerly Law 517)

Labour Law
The law governing unionized workplaces in Canada. Topics include freedom of association, the status of participants, union organization and certification, unfair labour practices, collective bargaining, the collective agreement and arbitration, industrial conflict, the duty of fair representation, and interaction between the labour law regime and the common-law of employment.

Corequisite(s): Prerequisite or Corequisite: Law 503.

700-Level Courses

Law 703 **H(3-0)(3 credits)**

Graduate Seminar in Legal Research and Methodology
Preparation for developing, researching and writing a thesis or major research paper. The distinctive nature of legal scholarship and its professional context will be explored. Students will be introduced to specific research techniques and to the challenges of comparative and cross-cultural work.

Note: This course is only open to students in the LLM program or by approval of the Graduate Director.

Law 705 **H(0-3)(3 credits)**

Graduate Seminar in Legal Theory
An exploration of schools of legal theory, with the goal of helping students situate their graduate research within one or more of those approaches to legal scholarship. The seminar is structured around a series of readings describing different theoretical approaches and applying these approaches to the areas of natural resources, energy and environmental law.

Note: This course is only open to students in the LLM program or by approval of the Graduate Director.

Law 706 **F(0-5)(5 credits)**

Major Research Paper
Under the supervision of a member of the Faculty of Law or other suitable person appointed by the Graduate Co-ordinator, students will complete a major research paper, approximately 50 to 60 pages (15,000 – 18,000 words) in length. The paper must reflect extensive research on a topic in natural resources, energy or environmental law, and it must propose a solution to a problem or present a critical evaluation of an issue in this area of law. The paper will be evaluated on a Pass/Fail basis by the supervisor and one other person appointed by the Graduate Co-ordinator. In the event of disagreement between the supervisor and the other appointee, the Graduate Co-ordinator shall determine whether the paper is a pass or fail after reading the paper and then consulting with the supervisor and other appointee.

Note: This course is only open to students in the LLM program.

Law and Society LWSO

Instruction offered by the Department of Sociology in the Faculty of Arts.

Junior Courses

Law and Society 201 **3 units; H(3-0)**

Introduction to Legal Studies
Overview of the role of law in society. Examination of different concepts of law. Study of legal rules, institutions, processes and personnel in social context. Discussion of construction and exercise of the power of law. Emphasis on Canadian law and legal system.

Law and Society 203 **3 units; H(3-0)**

Introduction to Legal Knowledge
This course examines the philosophy and science of law as tools of social engineering. Students will be introduced to tort, contract, property and criminal law and will review different schools of thought and legal movements specific to these areas of law. Current legal developments (including decided Canadian cases) will be covered to illustrate how concepts such as risk, negligence, neighbour principle, contractual obligations, offer and acceptance, consideration, remedies and punishment play out in contemporary Canadian society.

Senior Courses

Law and Society 335 **3 units; H(3-0)**

Equality Issues
An examination of the ability of the law to guarantee equality. Issues of gender, racial and class equality will be explored. Topics may include employment law, civil law, criminal law, reproductive rights and family law. All material is studied as it pertains to the Canadian legal culture.

Law and Society 337 **3 units; H(3-0)**

Self-Regulation
Examines how individuals and groups create, maintain, and follow non-legal codes of conduct and, in turn, regulate themselves and society. Students will be introduced to concepts of self-governance and moral regulation found in social manners, community standards, religious beliefs, as well as, consciously "legislated" group mechanisms such as professional codes of conduct, mission statements, and corporate governance practices.

Prerequisite(s): Law and Society 201.

Law and Society 401 **3 units; H(3-0)**

Special Topics in Law and Society
An examination of selected topics in Law and Society. See Schedule of Classes for current topic(s).

MAY BE REPEATED FOR CREDIT

Law and Society 413 **3 units; H(3-0)**

Liberalism
An examination of the fundamental conceptions of rights and freedoms in the works of J.S. Mill and twentieth- and twenty first-century philosophers. The treatment of these concepts in contemporary law and their role in contemporary legal and social issues are explored as well.

Prerequisite(s): Law and Society 201, 60 units (10.0 full-course equivalents) and admission to the Law and Society program.

Antirequisite(s): Credit for Law and Society 413 and 412 will not be allowed.

Note: Preference in enrolment is given to students who have completed at least 90 units. Registration for students who have completed fewer than 90 units but more than 60 units will open on a date specified by Enrolment Services.

Law and Society 415 **3 units; H(3-0)**

Socio-legal Issues in Contemporary Liberal Societies
An examination of the ways in which fundamental premises of legal liberalism, such as fairness, equality, and individual liberty, intersect with each other and with other key social values and premises. Contemporary challenges that may be explored in this course include privacy, the nature of the rights attached to property, the different understandings of democracy operating in different countries, and the extent to which the state should support religion.

Prerequisite(s): Law and Society 413, 60 units (10.0 full-course equivalents) and admission to the Law and Society program.

Antirequisite(s): Credit for Law and Society 415 and 412 will not be allowed. Course is not open to students who have completed fewer than 60 units.

Note: Registration for students who have completed fewer than 90 units but more than 60 units will open on a date specified by Enrolment Services.

Law and Society 425 **3 units; H(3-0)**

Law and Technology
Examines the relationship between law and legal institutions on the one hand, and science and technology on the other. Through close readings of texts and in-depth class discussion, students will investigate thematic issues such as the role of law in regulating science and technology; challenges to law raised by scientific discoveries and new technologies; and the influence of science and technology on law and legal institutions.

Prerequisite(s): 48 units (8.0 full-course equivalents).

Law and Society 501 **3 units; H(3-0)**

Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Program Co-ordinator.

Note: Students should contact the Department of Sociology at least two weeks prior to the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Law and Society 591 **3 units; H(3S-0)**

Integrative Seminar
An advanced seminar integrating philosophical, theoretical, social, and legal approaches to understanding the relationship between law and society.

Prerequisite(s): Law and Society 413 and 415, 60 units (10.0 full-course equivalents) and admission to the Law and Society major.

Antirequisite(s): Course is not open to students who have completed fewer than 60 units.

Note: Registration for students who have completed fewer than 90 units but more than 60 units will open on a date specified by Enrolment Services. Students may be required to attend court proceedings outside of class time which will be considered part of the course evaluation.

Linguistics LING

Instruction offered by members of the Department of Linguistics, Languages, and Culture in the Faculty of Arts.

Note: A student may not register in any Linguistics course unless a grade of at least "C-" has been achieved in each prerequisite for that course.

Junior Courses

Linguistics 201 **3 units; H(3-0)**

Introduction to Linguistics
Introduction to the scientific study of language, including the analysis of word, sentence, and sound structure, and the exploration of language as a human, biological, social, and historical phenomenon.

Antirequisite(s): Credit for Linguistics 201 and either 205 or 207 will not be allowed.

Linguistics 223 **3 units; H(3-0)**

Language and Advertising
An investigation of the nature of persuasive messages from the perspective of linguistic theory. Topics may include truth and falsity, implication, ambiguity, and context-dependence.

Senior Courses

Linguistics 301 **3 units; H(3-0)**

English Syntax
Introduction to syntax, using the structure of English as an illustration. Emphasis on tree-drawing and basic argumentation skills. Topics may include: syntactic categories; grammatical, thematic, and structural relations; syntactic movement.

Prerequisite(s): Linguistics 201.

Linguistics 303 **3 units; H(3-0)**

Phonology I
Theory and practice of phonological analysis: the classical phoneme; distinctive features and their

organization; methods of analysis; underlying and surface representations; rules and derivations.

Prerequisite(s): Linguistics 201.

Note: Linguistics 341 should be taken either before or concurrently with Linguistics 303.

Linguistics 309 **3 units; H(3-0)**

Language and Power
The nature of the linguistic resources used to create, enhance and justify positions of dominance or subordination, or to influence and persuade populations. Examples drawn from the discourse of gender and ethnic relations, government and business.

Linguistics 311 **3 units; H(3-0)**

Second Language Acquisition
Introduction to second language acquisition from both a linguistic and psycholinguistic perspective.

Prerequisite(s): Linguistics 201.

Linguistics 313 **3 units; H(3-0)**

Classroom-Oriented Second Language Research
Second language acquisition research that focuses on the second language learner in a variety of formal learning environments.

Prerequisite(s): Linguistics 201.

Linguistics 319 **3 units; H(3-0)**

Introduction to Semantics
Introduction to the study of conventional meaning. Topics may include: word meaning, propositional and predicate logic, properties of quantifiers, definite and indefinite descriptions, and pragmatics.

Prerequisite(s): Linguistics 201.

Linguistics 321 **3 units; H(3-0)**

Modern English Grammar
A comprehensive exploration of contemporary English. The course is based on modern linguistic analysis, but also includes traditional grammatical terminology, as well as language change, attitudes to language varieties and problems in usage.

Antirequisite(s): Credit for Linguistics 321 and 301 will not be allowed.

Note: Does not count towards the Linguistics Major.

Linguistics 331 **3 units; H(3-0)**

First Language Acquisition
An overview of major issues and developmental patterns in child language acquisition.

Prerequisite(s): Linguistics 201 or Psychology 200.

Antirequisite(s): Credit for Linguistics 331 and Psychology 349 will not be allowed.

Note: Students without Linguistics 201 will have to complete some supplemental reading in phonetics.

Linguistics 337 **3 units; H(3-0)**
(formerly Linguistics 437)

Introduction to Speech-Language Pathology
A comprehensive overview of the subject including: basic components of speech and language, normal language development, communication disorders, and current professional issues.

Prerequisite(s): Linguistics 201.

Antirequisite(s): Linguistics 437

Linguistics 341 **3 units; H(3-0)**

Phonetics I
Intensive practice in the perception, production and transcription of speech sounds accompanied by an introduction to the physiology and acoustics of speech.

Prerequisite(s): Linguistics 201.

Note: Preference in enrolment is given to students who have declared a Major in Linguistics. Registration information can be found on the Enrolment Services website: ucalgary.ca/registrar/. Linguistics 341 should be taken either before or concurrently with Linguistics 303.

Linguistics 349 **3 units; H(3-0)**

Language and Mind
An overview of central issues in the study of language and its relationship to the human mind. Topics may include the nature/nurture debate, human specialization for language, and theories of mental representation.

Prerequisite(s): Linguistics 201.

Linguistics 353 **3 units; H(3-0)**

Historical Linguistics I
Central topics in the study of language change including: principles and methods of linguistic reconstruction; universals, typologies, and the explanation of language change; sources of language change with a consideration of acquisitional and sociolinguistic factors.

Prerequisite(s): Linguistics 201.

Linguistics 373 **3 units; H(3-0)**

Introduction to Sociolinguistics
Social differentiation of language in terms of the gender, socio-economic status and geographical distribution of speakers.

Prerequisite(s): Linguistics 201.

Linguistics 377 **3 units; H(3-0)**

Introduction to Pragmatics
An introduction to the study of context-dependent meaning. Topics may include: deixis, reference, implicature, presupposition, speech acts, and information structure.

Prerequisite(s): Linguistics 201.

Linguistics 381 **3 units; H(3-0)**
(English 381)

The History of English
An introduction to important changes and stages in the history of English including its Indo-European and Germanic origins and a consideration of Modern English grammar and orthography from a historical perspective.

Prerequisite(s): Linguistics 201.

Linguistics 401 **3 units; H(3-0)**

Syntactic Analysis I
A theoretically grounded approach to syntax using data from a variety of languages. Constructing and evaluating syntactic hypotheses. May involve collecting data from a native speaker of a foreign language.

Prerequisite(s): Linguistics 301.

Linguistics 403 **3 units; H(3-0)**

Phonology II
Recent issues in phonological theory.

Prerequisite(s): Linguistics 303.

Linguistics 407 **3 units; H(3-0)**

Morphology I
An introduction to the study of word-structure, inflectional and word-formation morphology, morphological processes, morphological organization, interfaces with phonology and syntax. Practical problems in word analysis.

Corequisite(s): Prerequisite or Corequisite: Linguistics 303.

Linguistics 411 **3 units; H(3-0)**

Second Language Acquisition II
Current issues in the acquisition of a second language. Focus may be on phonology, syntax, semantics, or processing.

Prerequisite(s): Linguistics 311.

MAY BE REPEATED FOR CREDIT

Linguistics 419 **3 units; H(3-0)**

Advanced Semantics
Continuing study of conventional meaning accompanied by an introduction to some technical tools used in the field of semantics. Topics may include: compositionality, sets and functions, tense, aspect, modality, and event semantics.

Prerequisite(s): Linguistics 319.

Linguistics 431 **3 units; H(3-0)**

Child Language: Syntax and Morphology
Current topics in the fields of syntactic and morphological acquisition.

Prerequisite(s): Linguistics 201 and 301.

Linguistics 433 **3 units; H(3-0)**

Child Language: Phonology and the Lexicon
Current topics in the fields of phonological and lexical acquisition.

Prerequisite(s): Linguistics 303.

Linguistics 435 **3 units; H(3-0)**

Old English and its Closest Relatives
An introduction to the linguistic features of the early Germanic languages, with focus on Old English, Old Saxon, Old High German, and Gothic.

Prerequisite(s): At least one of English 381, 401, German 353, 469.04, Linguistics 353, or 381.

Linguistics 441 **3 units; H(3-0)**

Phonetics II
Continuing study of the anatomy, physiology, and acoustics of speech and related issues in speech research, paralleled by laboratory work in the acoustic and physiological analysis of speech.

Prerequisite(s): Linguistics 341.

Linguistics 451 **3 units; H(3-0)**

History of Linguistic Thought
A survey of major schools of linguistic thought. Focus on the origin and development of concepts central to contemporary linguistic theory.

Prerequisite(s): Linguistics 301 or 303.

Linguistics 453 **3 units; H(3-0)**

Historical Linguistics II
Current topics in the field of historical linguistics.

Prerequisite(s): Linguistics 353.

Linguistics 455 **3 units; H(3-0)**

Typology
Study of the unity and diversity of the world's languages. How do the grammars of individual languages differ from each other, and in what ways

are they all alike? Which characteristics are common across languages, and which are rare? An overview of the methodology and main results of typological research. Students work with data from unfamiliar languages.

Prerequisite(s): Linguistics 201 and 301.

Linguistics 467 **3 units; H(3-2)**
(Psychology 467) (formerly Linguistics 439)

Experimental Psycholinguistics
Exploration of the cognitive, neuropsychological, and social processes that underlie language abilities, with reference to linguistic theory. A laboratory component provides experience with methodologies used to study language behaviour.

Prerequisite(s): Linguistics 201.

Linguistics 491 **3 units; H(3-0)**
(formerly Linguistics 541)

Indo-European Linguistics
An introduction to the comparative study of the older stages of the principal Indo-European languages, and the reconstruction of the proto-language.

Prerequisite(s): Linguistics 353.

Linguistics 505 **3 units; H(3-0)**

Field Methods for Indigenous Languages
Principles and techniques of collecting, editing and analysing elicited linguistic data and associated problems. Practical experience with language consultant(s).

Prerequisite(s): Linguistics 301 and 303.

Linguistics 507 **3 units; H(3-0)**

Morphology II
A survey of issues in morphological theory.

Prerequisite(s): Linguistics 401 and 407.

Antirequisite(s): Credit for Linguistics 507 and either 551.02 or 599.13 will not be allowed.

Linguistics 511 **3 units; H(3-0)**

Syntactic Analysis II
A survey of current work in syntactic theory.

Prerequisite(s): Linguistics 401.

Linguistics 519 **3 units; H(3-0)**
(Philosophy 519)

Formal Semantics of Natural Language
Central issues in the logical semantics of natural language, focusing on topics such as quantification, scope, and the interpretation of pronouns.

Prerequisite(s): Philosophy 279 or 377. Philosophy 371 or Linguistics 319 recommended.

Antirequisite(s): Credit for Linguistics 509 will not be allowed.

Linguistics 531 **3 units; H(3-0)**

Survey of Indigenous Languages of the Americas
A survey of the indigenous languages of the Americas, including classifications of language families and structural analysis of selected languages.

Prerequisite(s): Linguistics 301 or 303.

Linguistics 551 **3 units; H(3-0)**

Linguistic Analysis
Linguistic analysis of a language or language family.

Prerequisite(s): Linguistics 301 or 303.

Note: Consult Department regarding topics offered in any given year.

MAY BE REPEATED FOR CREDIT

Linguistics 560 **3 units; H(3-0)**

Statistics for Linguistic Research
Introduction to basic statistical concepts, methods of analysis, and quantitative modelling techniques, with a focus on their application to the unique properties of language research and linguistic data.

Prerequisite(s): Consent of the Department.

Linguistics 598 **6 units; F(3S-0)**

Independent Research
Open only to Honours students who are in the last year of their program. Students are expected to carry out a specific research project under the supervision of a staff member and submit a thesis acceptable to the Department.

Linguistics 599 **3 units; H(3S-0)**

Conference Course
Directed research in areas of special interest to advanced students.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599. Admission to all 600-level courses is with consent of the Department in addition to any other prerequisites which may be stated.

Linguistics 600 **1.5 units; Q(2-0)**

Introduction to Graduate Studies in Linguistics
This course provides an introduction to areas of research and theoretical orientations in which faculty in this department specialize, as well as to research and professional skills.

NOT INCLUDED IN GPA

Linguistics 605 **3 units; H(3-0)**

Field Methods
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Linguistics 611 **3 units; H(3-0)**

Advanced Syntactic Analysis
An advanced course in syntactic theory with focus on analytical and critical skills required for conducting syntactic research.

Prerequisite(s): Linguistics 511 and consent of the Department.

Linguistics 613 **3 units; H(3-0)**

Advanced Phonological Analysis
An advanced course in phonological theory with focus on analytical and critical skills required for conducting phonological research.

Prerequisite(s): Linguistics 403 and consent of the Department.

Linguistics 631 **3 units; H(3-0)**

Topics in Linguistic Theory
Seminar in any area of theoretical linguistics, including phonetics, phonology, morphology, syntax, and semantics.

631.01. Phonetics

631.02. Phonology

631.03. Morphology

631.04. Syntax

631.05. Semantics

Prerequisite(s): Consent of the Department.

Note: Consult the Department regarding topics offered in any given year as topics vary. Not offered every year.

Linguistics 633 **3 units; H(3-0)**

Topics in Language Acquisition
Seminar in language acquisition.

633.01. First Language Acquisition

633.02. Second Language Acquisition

Prerequisite(s): Consent of the Department.

Note: Consult the Department regarding topics offered in any given year as topics vary. Not offered every year.

Linguistics 635 **3 units; H(3-0)**

Analysis of a Language or Language Family
Seminar in the analysis of a selected language or language family

Prerequisite(s): Consent of the Department.

Note: Consult the Department regarding topics offered in any given year as topics vary. Not offered every year.

MAY BE REPEATED FOR CREDIT

Linguistics 651 **3 units; H(3-0)**

Topics in Historical Linguistics
Seminar in historical linguistics.

Note: Consult the Department regarding topics offered in any given year as topics vary. Not offered every year.

MAY BE REPEATED FOR CREDIT

Linguistics 660 **3 units; H(3-0)**

Quantitative Modelling of Linguistic Data
Introduction to basic statistical concepts, methods of analysis, and quantitative modelling techniques, with a focus on their application to the unique properties of language research and linguistics data.

Prerequisite(s): Consent of the Department.

Linguistics 697 **3 units; H(3-0)**

Thesis Research Development

Linguistics 699 **3 units; H(3S-0)**

Conference and Reading Course
MAY BE REPEATED FOR CREDIT

Linguistics 797 **1.5 units; Q(2-0)**

Senior Doctoral Seminar
A forum for discussing and presenting candidacy paper research, thesis research, and conference presentations/publications in preparation.

NOT INCLUDED IN GPA

Management Studies MGST

Instruction offered by members of the Haskayne School of Business.

Junior Course

Management Studies 217 3 units; H(3-0)

Introduction to Business Analytics
Introduction to data representation and analysis. Students will think critically about business problems, gather, evaluate, analyze and synthesize relevant data, and create insightful models to improve the quality of decisions. Communicating and presenting quantitative analysis to lead managerial decision making will be emphasized while continuing to advance both individual and group leadership skills.

Prerequisite(s): Admission to the Haskayne School of Business Bachelor of Commerce program.

Antirequisite(s): Credit for Management Studies 217 and Business and Environment 291 will not be allowed.

Senior Courses

Management Studies 391 3 units; H(3-3T)

Business Analytics
Business Analytics uses data, information technology, statistical analysis, and quantitative methods to build models that help managers gain improved insight about their business processes and make better, fact-based decisions. Students will analyze complex business problems and apply higher-level modelling techniques including optimization, simulation, decision analysis, queuing theory and forecasting.

Prerequisite(s): Admission to the Haskayne School of Business, Mathematics 249 or 251 or 265 or 281, Statistics 217, Management Studies 217 and Strategy and Global Management 217.

Management Studies 451 3 units; H(3-0)

Corporate Governance and Ethical Decision-Making
Develop an increased awareness of the importance of corporate governance systems and strong financial decision making systems in developing effective business enterprises. Specific emphasis on the resolution of agency problems, the role of the board of directors, compensation systems and financial modelling.

Prerequisite(s): Admission to the Haskayne School of Business Bachelor of Commerce program and 54 units (9.0 full-course equivalents) including Finance 317.

Antirequisite(s): Credit for Management Studies 451 and any of Business and Environment 291, Management Studies 491, 493 or 495 will not be allowed.

Management Studies 453 3 units; H(3-0)

Ethical Leadership
Students will develop skill in applying a variety of different ethics frameworks to problems and an understanding of when various frameworks are most applicable. Critical thinking skills will be honed using cases, readings, class discussions and written opinion. Leadership theories, including gender and cultural influences, will be covered. Students will be able to identify components of their leadership styles in self and others. Tools to operationalize ethical choices will be provided. Students will witness and experience leadership as it progresses from individual to team to organizational to community levels.

Prerequisite(s): Admission to the Haskayne School of Business Bachelor of Commerce program and 54 units (9.0 full-course equivalents) including Human Resources and Organizational Dynamics 317.

Antirequisite(s): Credit for Management Studies 453 and any of Business and Environment 291, Management Studies 491, 493 or 495 will not be allowed.

Management Studies 493 1.5 units; Q(3-0)

Corporate Governance and Control
Develop an improved awareness of the importance of corporate governance systems in developing effective business enterprises. Specific emphasis on agency problems, the role of the board of directors, and compensation systems.

Prerequisite(s): Admission to the Haskayne School of Business and 84 units (14.0 full-course equivalents) including Finance 317.

Antirequisite(s): Credit for Management Studies 493 and any of 217, 491 or Strategy and Global Management 217 will not be allowed.

Management Studies 495 1.5 units; Q(3-0)

Working with People
Development of interpersonal, team, and leadership skills through enhanced self-awareness, and skill application. Topics include teamwork, learning styles, values and personal needs, behavioural styles, individual and group conflict, supportive communications, and other issues. Personal assessment and skill application receive emphasis in this course.

Prerequisite(s): Admission to the Haskayne School of Business and 84 units (14.0 full-course equivalents) including Human Resources and Organizational Dynamics 317.

Corequisite(s): Management Studies 493.

Antirequisite(s): Credit for Management Studies 495 and 217, 491 or Strategy and Global Management 217 will not be allowed.

Management Studies 511 3 units; H(3-0)

Leadership Skills: Student Business Start-up
Provides general management skills through hands-on facilitation of a new business start-up. Teaching business basics to elementary school students and guiding them through the start-up, running and shut-down phases of a fundraising business.

Prerequisite(s): Admission to the Haskayne School of Business, consent of the Haskayne School of Business and 90 units (15.0 full-course equivalents).

Management Studies 559 3 units; H(3-0)

Selected Topics in Management
Examination of selected topics in management.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Note: For certain topics, consent of the Haskayne School of Business will be required.

MAY BE REPEATED FOR CREDIT

Management Studies 571 3 units; H(3-3)

Management of International Trade
Concepts and skills required to conduct international transactions in goods and services, including contracts, transportation, financing, insurance, customs clearance, compliance with import/export regulations and dispute resolution.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Management Studies 597 3 units; H(3-0)

Directed Study in Management Studies
In-depth study in one of the functional areas of business.

Prerequisite(s): Admission to and consent of the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Note: May be repeated once for credit.

Graduate Courses

Management Studies 601 1.5 units; Q(3-0)

Skills Development
Introduction to basic MBA Skills required for effective learning throughout the MBA Program. Specific topics may include business communications and writing, report writing, oral presentations, team roles and responsibilities, critical thinking and case analysis.

Antirequisite(s): Credit for Management Studies 601 and 790.01 will not be allowed.

Management Studies 611 3 units; H(3-0)

Managerial Economics
Introduction to economic models for business decision making. Models from microeconomics are applied to provide insight in understanding costs, pricing, industry structure, and competitive interaction. Information economics is used to illustrate principal-agent problems that commonly arise in a business context. Macroeconomic models of supply and demand are applied to illustrate how government policy affects inflation and exchange rates.

Management Studies 613 3 units; H(3-0)

Managerial Decision Modelling
The transformation of raw data into useful information for decision-making. Quantitative models are implemented with spreadsheets to develop skills in generating managerial insight from data and in dealing with uncertainty. Topics covered include basic probability and statistics, decision trees, regression analysis, optimization, and simulation.

Management Studies 715 3 units; H(3-0)
(formerly Management Studies 615)

Strategic Business Analysis
Introduction to strategic analysis. Integration of learning from various management disciplines through a "field experience" study of a business firm.

Prerequisite(s): Strategy and Global Management 601.

Antirequisite(s): Credit for Management Studies 715 and 615 will not be allowed.

Management Studies 741 3 units; H(3-0)

Business Process Improvement and Creative Problem Solving
Business process improvement and creative problem solving as critical components of competitiveness. The adjective "business" is used to indicate that the course emphasizes improvements in non-manufacturing processes (of relevance to all organizations) in such areas as development, distribution, financial accounting/planning, order entry, personnel, and purchasing. Topics covered include the relationship to Total Quality Management and Time-Based Competition, incremental

versus radical improvement, selection of key processes for study (including bench-marking and the role of capacity constraints), process flow diagramming, Pareto analysis, cause-and-effect analysis, statistical control charts, affinity diagrams, and steps in creative problem solving. Team exercises and projects make up a substantial portion of the course.

Prerequisite(s): Operations Management 601.

Management Studies 743 3 units; H(3-0)

International Logistics
The topic of logistics is concerned with managing the activities along a supply chain, from procuring materials to delivering goods that satisfy customers. In today's global economy, both suppliers and customers can be dispersed around the world. In this course students learn the processes required to manage the flow of materials and products from suppliers to customers in order to achieve a competitive advantage. They will study theoretical concepts and evaluate through practical cases how physical distribution, procurement and production can become effective key business supporters.

Prerequisite(s): Operations Management 601.

Management Studies 751 3 units; H(3-0)

Global Energy Finance and Accounting
Problems related to evaluating and financing energy enterprises. Financial and accounting principles applied to valuing and financing energy projects. Financial reporting, managerial control systems, theory of financing, valuation, and deal structuring. Focus on private sector energy enterprises.

Prerequisite(s): Accounting 603 and Finance 601.

Management Studies 761 3 units; H(3-3T)

Personal Financial Management in Canada
Introduction to personal financial management in Canada. Goal setting, personal financial statements analysis, the time value of money, the Canadian personal income tax system, taxation issues for small businesses, risk management, an overview of investments, retirement planning and estate planning. Completion of a personal financial plan by the end of the course.

Prerequisite(s): Finance 601.

Notes: May not be used as part of a student's major in Finance.

Management Studies 770 1.5 units; Q(3-0)

Topics in Leadership
Students near graduation must prepare for the transition from individual contributor to team and organization leader. This course is a comprehensive assessment of leadership from the dimensions of creating a leadership mindset and managing relationships (subordinates, peers, superiors and stakeholders). The topics may be addressed through theory development, simulation, case and experiential methods to provide to a full awareness and appreciation of the corporate responsibility, ethical dilemmas, and societal impacts of decision-making within business, not-for-profit, and institutional leadership environments.

Prerequisite(s): Management Studies 601.

Antirequisite(s): Credit for Management Studies 770 and 790.02 will not be allowed.

PhD Courses

Management Studies 773 3 units; H(3-0)

Multivariate Analysis in Management
Multivariate Analysis in Management is concerned with the study of association among sets of measurements. This multivariate statistics course is intended primarily for PhD students in Management although MBA (Thesis) students pursuing an empirical-based thesis can also benefit. The objective of this course is to introduce graduate students to a variety of multivariate statistical techniques and methods to enable them to effectively carry out an empirical research study in management including the business, public, and not-for-profit sectors. Topics include: introduction to research design and multivariate methods, linear regression, logistic regression, analysis of variance and covariance, multivariate analysis of variance, discriminant analysis, principal components analysis, common factor analysis, and additional multivariate topics if time permits. The technical level of treatment would require basic understanding of matrix and linear algebra and at least one first level course in statistics. Such preliminary technical understanding will be helpful to appreciate the theory and intuition behind the multivariate techniques. A good blend of technical, conceptual, and practical aspects (using SPSS software) of the course will be maintained.

Prerequisite(s): Consent of the Haskayne School of Business.

Management Studies 781 3 units; H(3-0)

Philosophy of Science in Management Studies
Historical and critical perspectives of classical issues in philosophy of science, nature of scientific explanation, confirmation of scientific theories, theories of truth, distinctions between science and non-science.

Prerequisite(s): Consent of the Haskayne School of Business.

Management Studies 783 3 units; H(3-0)

Advanced Research Methodology and Methods
Research methodology relevant to examination and testing of theoretical and applied issues in management. The development and testing of research concepts; research operations, designs and analysis.

Prerequisite(s): Consent of the Haskayne School of Business.

Management Studies 789 3 units; H(3S-0)

Seminar in Management Studies
Intensive study and discussion of current literature and research with respect to selected topics in Management Studies.

Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Management Studies 790 1.5 units; Q(3-0)

Seminar in Management Studies
Intensive study and discussion of current literature and research with respect to selected topics in Management Studies.

Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Management Studies 791 3 units; H(3-0)

Management Education Seminar
Curricular and course design, instructional techniques, instructional tools, teaching styles, career planning and professional ethics. Nature, role and function of universities, and business schools, business school relations.

Prerequisite(s): Consent of the Haskayne School of Business.

Note: Doctoral students whose supervisors are members of the Haskayne School of Business are required to register in this seminar in the second year of doctoral studies.

NOT INCLUDED IN GPA

Management Studies 792 6 units; F(1-0)

Research Development
Development of research skills through participation in a well defined project under the direct supervision of an experienced researcher.

Prerequisite(s): Management Studies 781 or 783.

Management Studies 793 3 units; H(3S-0)

Conceptual Frameworks of the Enterprise
Advanced, comparative institutional analysis to explain the choice of the firm's boundaries, the governance mechanisms to manage the interface with the external environment and the internal organizational design, so as to reduce transaction costs and facilitate value creation.

Prerequisite(s): Consent of the Haskayne School of Business.

Management Studies 794 3 units; H(3S-0)

Theory Development
Processes of building, testing, and disseminating business management theories. Focus on the elements that constitute a theory, requirements for theory validation, and the role of theory in business management research. Analysis of mainstream theories in business management research. Readings include philosophy of science and management research materials on theory development and dissemination.

Prerequisite(s): Consent of the Haskayne School of Business.

Management Studies 797 3 units; H(3-0)

Directed Graduate Study in Management
Coverage of various topics on the basis of student and faculty interest.

Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Management Studies 799 3 units; H(3-0)

Topics in Management Studies
Coverage of various topics on the basis of student and faculty interests.

Prerequisite(s): Consent of the Haskayne School of Business

MAY BE REPEATED FOR CREDIT

Manufacturing Engineering ENMF

Instruction offered by members of the Department of Mechanical and Manufacturing Engineering in the Schulich School of Engineering.

Senior Courses

Manufacturing Engineering 417 3 units; H(3-3)

Manufacturing and Production Processes
The role and characterization of manufacturing technology within the manufacturing enterprise. Overview of deformation processes, joining processes, consolidation processes, material-removal processes, and material alteration processes. Process selection and planning.

Prerequisite(s): Engineering 200.

Manufacturing Engineering 501 3 units; H(3-2)

Modelling and Simulation of Manufacturing Systems

General modelling of production systems. Spreadsheet modelling for capacity analysis. Fundamentals of discrete-event simulation including: key concepts; simulation world views; the simulation study life cycle. Modelling and programming aspects of discrete-event simulation including: verification and validation; simulation animation; interfacing simulation software with other systems. Statistical aspects of discrete-event simulation including: random number and random variate generation; input process modelling; output analysis; variance reduction techniques. Applications of discrete-event simulation to the design and analysis of manufacturing systems.

Prerequisite(s): Engineering 319.

Manufacturing Engineering 503 3 units; H(3-2)

Computer-Aided Design and Manufacturing

Hardware and software for computer-aided design and manufacturing (CAD/CAM) systems. Geometric modelling, transformation and visualization. Modelling of freeform curves and surfaces. Programming for computer numerically controlled (CNC) machining. Integration of CAD/CAM systems, Applications in motion analysis, structure analysis, optimization, rapid prototyping, reverse engineering and virtual engineering.

Prerequisite(s): Manufacturing Engineering 417 and Mechanical Engineering 337.

Antirequisite(s): Credit for Manufacturing Engineering 503 and 401 will not be allowed.

Manufacturing Engineering 509 3 units; H(3-2)

Advanced Manufacturing Systems

Manufacturing strategy and competitive manufacturing. Queuing theory and its application to manufacturing systems analysis (including rapid modelling tools). Linear programming and its application to manufacturing systems problems. Scheduling problems in manufacturing. Supply chain modelling and integration. Enterprise resource planning systems.

Manufacturing Engineering 514 3 units; H(3-2)

Integrated Manufacturing Systems

Fundamentals of integrated and competitive manufacturing. Manufacturing and operations strategy. Topics in production and operations management including: production planning and control systems; inventory management systems; process analysis and improvement; quality management systems.

Manufacturing Engineering 517 3 units; H(3-2)

Experimental Design and Analysis

Introduction to statistical Design of Experiments (DOE) techniques for efficient data collection, analysis and interpretation. Analysis of Variance (ANOVA), including blocking and nesting, in full and fractional factorial designs to understand sources of variation in performance. Robust design, including classical response surface and Taguchi techniques, to minimize effects of environmental factors on performance variability. Applications to product and process improvement.

Prerequisite(s): Engineering 319.

Manufacturing Engineering 527 3 units; H(3-2/2)

Project Engineering

The project lifecycle. Project planning, scheduling, and control. Resource considerations. Cost estimating, planning, and performance. Project risk. Project personnel and organizational structures.

Manufacturing Engineering 529 3 units; H(3-2)

Introduction to Microelectromechanical Systems

Microelectromechanical systems (MEMS) and devices including microsensors and microactuators. Principles of operation, material properties, fabrication techniques including surface and bulk micromachining, IC-derived microfabrication techniques, sensing and actuation principles, sensor dynamics issues, circuit and system issues, packaging, calibration and testing. Illustrative examples include (1) micromachined inertial sensors and actuators for manufacturing processes, (2) microactuator arrays for "smart surfaces," (3) biosensors for medical applications, and (4) transducers for aerospace applications.

Manufacturing Engineering 533 3 units; H(3-2/2)

Computer-Based Control for Industrial Automation

Concepts of digital control. Digital circuits. Logic Controller architecture, programming using digital logic concepts, and interfacing. I/O devices sensors and actuators. Applications to work cells and production lines.

Antirequisite(s): Credit for Manufacturing Engineering 533 and 515 will not be allowed.

Graduate Courses

Manufacturing Engineering 605 3 units; H(3-0)

Planning and Control of Computer Integrated Manufacturing

Advanced techniques for the design, planning, and control of integrated manufacturing systems. Course elements include: a framework for manufacturing planning and control; data flow and structured modelling methodologies; hierarchical models of manufacturing; cellular manufacturing organization; databases and communications; forecasting, demand management, capacity planning and master production scheduling; materials requirements planning, manufacturing resource planning, Just-in-Time manufacture, and Optimized Production Technology; control of independent demand inventory items; production activity control, shop floor control, scheduling, order release and dispatching; simulation in planning and control.

Manufacturing Engineering 607 3 units; H(3-0)

Total Quality Management

Statistical Process Control (SPC) for discrete and continuous manufacturing processes. Acceptance Sampling. Process capability analysis. Introduction to design of experiments (DOE). Overview of quality economics, quality standards and management philosophy.

Manufacturing Engineering 609 3 units; H(3-0)

Design and Analysis of Experiments

Statistical Design of Experiments (DOE) techniques for efficient data collection, analysis and interpretation. Analysis of Variance (ANOVA), including blocking and nesting, in full and fractional factorial designs. Robust design, including classical response surface and Taguchi techniques. Applications to product and process improvement.

Manufacturing Engineering 613 3 units; H(3S-0)

Research Seminar I

Reports on studies of the literature or of current research. This course is compulsory for all MSc and thesis-route MEng students and must be completed before the thesis defence.

NOT INCLUDED IN GPA

Manufacturing Engineering 619 3 units; H(3-0)

Special Problems in Manufacturing Engineering

Designed to provide graduate students, especially at the PhD level, with the opportunity of pursuing advanced studies in particular areas under the direction of a faculty member. Students would be required to consider problems of an advanced nature.

MAY BE REPEATED FOR CREDIT

Manufacturing Engineering 621 3 units; H(3-0)

Optimization Methods with Robotics Applications

Designed for graduate and senior undergraduate students interested in advanced topics in robotics. Based on the students' research topics, contents may vary. These include: fundamental theory in robotics, mathematical toolbox for optimization, differential kinematics, kinematics and actuation redundancy, optimal control, co-operating manipulators, redundancy in force sensing and sensor fusion.

Manufacturing Engineering 623 3 units; H(3-0)

CAD/CAM/CAE

Components of CAD/CAM/CAE systems. Geometric modelling. Development of customized CAD systems. Complex shape modelling. Computer-aided process planning. CNC machining. Rapid prototyping. Finite element analysis and motion analysis. Engineering optimization. Virtual design and manufacturing.

Manufacturing Engineering 698 6 units; F(0-4)

Graduate Project

Individual project in the student's area of specialization under the guidance of the student's supervisor. A written proposal, one or more written progress reports, and a final written report are required. An oral presentation is required upon completion of the course. Open only to students in the MEng (courses only) program.

Manufacturing Engineering 713 3 units; H(3S-0)

Research Seminar II

Reports on studies of the literature or of current research. This course is compulsory for all PhD students and must be completed before the candidacy examination.

NOT INCLUDED IN GPA

Marine Science MRSC

Most formal courses in Marine Science are offered at the Bamfield Marine Sciences Centre that is owned by the Western Canadian Universities Marine Sciences Society. The Centre is situated in Bamfield on the Pacific Coast of Vancouver Island, B.C. Instructors are drawn generally from the staffs of the participating universities (University of Alberta, University of Calgary, University of British Columbia, Simon Fraser University, University of Victoria).

Appropriate courses at the 300 level (or higher) in Biology, Plant Biology (Botany) and/or Zoology are prerequisite to these courses.

Each six unit (full) course will last six weeks (plus four days travelling time) with an average of 50 hours weekly of lectures, laboratories, tutorials and field trips.

Fall Program: The Western Canadian Universities Marine Sciences Society offers an integrated program of courses in Marine Biology at the Bamfield Marine Sciences Centre. Attendance at the program requires residence at Bamfield Marine Sciences Centre for an entire Fall Term. Details

are available from the Department of Biological Sciences.

University of Calgary students must apply to and be accepted by the Centre before they are permitted to register for the Marine Science courses at the University of Calgary. For further information students should consult the Department of Biological Sciences.

†Numbers in parentheses are the course numbers listed by the Bamfield Marine Sciences Centre. In many cases these courses have been renumbered to fulfill University of Calgary requirements. The courses listed below are not necessarily offered every year. Other courses and specific titles in special topics courses will be offered yearly. Students are requested to check current listings in the Department of Biological Sciences.

Senior Courses

Marine Science 321 **3 units; H(3-0)**

Introduction to Marine Science
Exploring the ocean environment, marine organisms, marine ecosystems and the impact of humans on the sea.

Prerequisite(s): Any two of Biology 231, 233, 241 and 243.

Note: This course is offered on the main campus and not at the Bamfield Marine Sciences Centre.

Marine Science 420 **6 units; F(3-3)**

Marine Phycology
A survey of the marine algae, with emphasis on the benthic forms in the vicinity of the Bamfield Marine Sciences Centre. Lectures, laboratory work, field collecting, identification and observation. The study of living specimens is emphasized both in the laboratory and in the field.

Prerequisite(s): Consent of the Department.

Marine Science 430 **6 units; F(3-3)**

Marine Ecology
An analytical approach to biotic associations in the marine environment. Opportunities will be provided for study of the intertidal realm in exposed and protected areas and of beaches and estuaries in the vicinity of the Bamfield Marine Sciences Centre; plankton studies and investigations of the subtidal and benthic environments by diving and dredging are envisaged.

Prerequisite(s): Consent of the Department.

Marine Science 440 (Marine Science 411†) **6 units; F(3-3)**

Comparative Invertebrate Embryology
A study of developmental patterns in marine representatives of most major and minor invertebrate phyla. Lecture topics will include fertilization and embryonic development as well as larval structure, behaviour and metamorphosis. Laboratory work will include methods and techniques of obtaining and handling of gametes, preparation and maintenance of larval cultures and observations on development. Various pelagic larvae collected from the plankton will be studied and some experimental work will be included.

Prerequisite(s): Consent of the Department.

Marine Science 450 (Marine Science 435†) **6 units; F(3-3)**

Introduction to Biological Oceanography
The biology of the oceans; supporting coverage of relevant physics and chemistry; plankton biology, community structure and life histories and influencing environmental factors. Collections will be made from sheltered inlets through Barkley Sound to offshore waters; field and laboratory studies of plankton organisms.

Prerequisite(s): Consent of the Department.

Marine Science 451 (Marine Science 450†) **3 units; H(3-3)**

Principles of Aquaculture
Interdisciplinary introduction to the principles underlying the commercial cultivation of aquatic plants and animals emphasizing marine systems. The course will include working site-visits to a range of commercial farms and Research and Development facilities.

Prerequisite(s): Biology 243 and consent of the Department.

Marine Science 500 (Marine Science 400†) **6 units; F(0-6)**

Directed Studies
Directed studies under the supervision of a member of the faculty. Involves a research project approved by the supervisor in the field of interest of the student, and will be designed to take maximum advantage of the laboratory and/or field opportunities offered by the Bamfield Marine Sciences Centre.

Prerequisite(s): Consent of the Department.

Marine Science 501 (Marine Science 402†) **3 units; H(3-3)**

Special Topics in Marine Biology
This course will be offered, as opportunities arise, by distinguished scientists visiting at the Bamfield Marine Sciences Centre who are prepared to offer a course extending over a 3 week period.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Marine Science 502 (Marine Science 401†) **6 units; F(300 hours)**

Special Topics in Marine Biology
This course will be offered, as opportunities arise, by distinguished scientists visiting at the Bamfield Marine Sciences Centre who are prepared to offer a course extending over a 6-week period.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Marine Science 503 (Marine Science 454†) **3 units; H(3-3)**

Special Topics in Aquaculture
Examination of the culture techniques for selected groups of aquatic plants, animals or microorganisms. Participants will be expected to complete a project which examines some aspect of applied science relevant to commercial culture.

Prerequisite(s): Marine Science 451 and consent of the Department.

MAY BE REPEATED FOR CREDIT

Marine Science 505 (Marine Science 460†) **3 units; H(3-3)**

Special Topics in Aquacultural Applied Science
Examination of the principles underlying the application of selected areas of scientific information to commercial aquaculture. Participants will be expected to complete a written project.

Prerequisite(s): Marine Science 451 and consent of the Department.

MAY BE REPEATED FOR CREDIT

Marine Science 507 **3 units; H(0-6)**

Directed Studies
Directed studies under the supervision of a member of the faculty. Involves a research project approved by the supervisor in the field of interest of the student, and will be designed to take maximum advantage of the laboratory and/or field opportunities offered by the Bamfield Marine Sciences Centre.

Prerequisite(s): Consent of the Department.

Marine Science 509 (Marine Science 470†) **3 units; H(0-6)**

Directed Research in Aquaculture
Design and execution of a research project in the field of aquaculture under the supervision of a scientist working in association with the Bamfield Sciences Centre. A written report is a requirement.

Prerequisite(s): Marine Science 451 and consent of the Department.

Marine Science 511 (Marine Science 480†) **3 units; H(3S-0)**

Papers and Seminar in Marine Science
The purpose of this course is to provide a forum for students to integrate the knowledge they are obtaining from the other courses in this program. It will be a combination of presentations by resident and visiting researchers followed by discussion, discussion of original papers selected by the instructor(s), and short critiques of original papers by each student.

Prerequisite(s): Consent of the Department. Students are expected to have completed at least 54 units (9 full-course equivalents) of a Biology program. Others may be admitted by permission of the instructor in consultation with the Bamfield Marine Sciences Centre.

Marine Science 515 (Marine Science 415†) **3 units; H(3-3)**

Structure and Function in Marine Animals
This course will use marine invertebrates and vertebrates to explore the structural plans of animals in a functional framework. Rather than providing a comprehensive survey of diversity in the animal kingdom, specific taxa will be chosen that exemplify specific systems (e.g., respiratory, skeletal, nervous, etc.). The major taxa will be discussed together with minor groups that have peculiarities that are of general biological importance. This course will combine the disciplines of classification, evolution, morphology, biomechanics, physiology and biochemistry. The emphasis placed on each discipline will depend on the interests of the instructor. Field work will be integrated with the laboratory exercises.

Prerequisite(s): Consent of the Department. Students are expected to have completed at least 54 units (9 full-course equivalents) of a Biology program and to have successfully completed introductory courses in organismal diversity, physiology, cell biology and/or biochemistry. Others may be admitted by permission of the instructor in consultation with the Bamfield Marine Sciences Centre.

Marine Science 525 (Marine Science 425†) **3 units; H(3-3)**

Ecological Adaptations of Seaweeds
An exploration of morphological, physiological, genetic and reproductive adaptations of seaweeds to their natural and man-altered environments. Daily

lectures and laboratory exercises will complement frequent field observations.

Prerequisite(s): Consent of the Department. Students are expected to have completed at least 54 units (9 full-course equivalents) of a Biology program and to have successfully completed courses in organismal diversity, introductory genetics, cell biology and/or biochemistry. Statistics is recommended. Others may be admitted by permission of the instructor in consultation with the Bamfield Marine Sciences Centre.

Marine Science 537 (Marine Science 437†) **3 units; H(3-3)**

Population and Community Ecology of Marine Organisms
An introduction to the concepts of marine plant, animal and community ecology. Emphasis will be on organism/physical and chemical environmental interactions, organismal interactions, and concepts of biological diversity. Daily lectures and laboratory exercises will be complemented by frequent field excursions.

Prerequisite(s): Consent of the Department. Students are expected to have completed at least 54 units (9 full-course equivalents) of a Biology program. Statistics is recommended. Others may be admitted by permission of the instructor in consultation with the Bamfield Marine Sciences Centre.

Marine Science 540 (Marine Science 440†) **6 units; F(3-3)**

Biology of Marine Birds
A study of the interrelationship of birds and the marine environment. Lectures will emphasize the systematics and ecological relationships, behaviour, life histories, movements and conservation of marine birds. Census techniques and methods of study of marine birds in the field will be considered. Seabird identification, classification, morphology, plumage and moult will be examined in the laboratory.

Prerequisite(s): Zoology 377 and consent of the Department.

Marine Science 544 (Marine Science 445†) **6 units; F(3-3)**

Biology of Marine Mammals
A survey course covering systematics and distribution of marine mammals, their sensory capabilities and physiology, with special emphasis on the Cetacea. The course will include field work in the vicinity of Barkley Sound and will include an independent field study.

Prerequisite(s): Zoology 377 and consent of the Department.

Marine Science 546 (Marine Science 446†) **6 units; F(3-3)**

Comparative Ethology
A comparative study of marine animals (vertebrate and invertebrate) emphasizing behavioural description, underlying physiological mechanisms, the biological significance of behaviour and behavioural evolution. The course will include independent laboratory and field studies.

Prerequisite(s): Zoology 375, 377, Biology 313, and consent of the Department.

Antirequisite(s): Credit for Zoology 567 and Marine Science 546 will not be allowed.

Note: Completion of Zoology 461 and either 463 or 465 prior to this course will be of definite advantage.

Marine Science 572 (Marine Science 410†) **6 units; F(3-3)**

Marine Invertebrate Zoology
A survey of the marine phyla emphasizing natural history, morphology and systematics of the local invertebrate fauna. The course will include lectures, laboratory work, field collection, identification and observation. The study of living specimens is emphasized both in the laboratory and in the field.

Prerequisite(s): Consent of the Department.

Marine Science 574 (Marine Science 412†) **6 units; F(3-3)**

Biology of Fishes
Classification, physiology, ecology, behaviour and zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. Involves some field projects.

Prerequisite(s): Consent of the Department.

Marine Science 582 (Marine Science 413†) **6 units; F(3-3)**

Biology of Marine Molluscs
An advanced course of selected topics emphasizing functional morphology, ecology and evolution. Field trips will be undertaken to survey the representative molluscs of the Bamfield region. Students will be expected to complete an independent field or laboratory study of selected molluscs.

Prerequisite(s): Marine Science 572/410 and consent of the Department.

Graduate Courses

Enrolment in any graduate course requires consent of the Department.

600-level courses are available with permission to undergraduate students in the final year of their programs.

Special Graduate Courses: Each year the Western Canadian Universities Marine Biological Society offers short (one-week) intensive courses especially for graduate students interested in Marine Biology. Topics vary from year to year. Details are available from the Department of Biological Sciences.

Marine Science 600 (Marine Science 500†) **6 units; F(0-6)**

Directed Studies
A course of directed studies under the supervision of a member of faculty, involving a research project approved by the supervisor. Each study will be designed to take maximum advantage of laboratory and/or field opportunities offered by the Bamfield Marine Sciences Centre.

Prerequisite(s): Consent of the Department.

Marine Science 601 (Marine Science 502†) **3 units; H(3-3)**

Special Topics (3 weeks)
Courses of a specialized nature offered, as opportunities arise, by distinguished scientists visiting the Bamfield Marine Sciences Centre.

Prerequisite(s): Consent of the Department.

Marine Science 602 (Marine Science 501†) **6 units; F(3-3)**

Special Topics (6 weeks)
Courses of a specialized nature offered, as opportunities arise, by distinguished scientists visiting the Bamfield Marine Sciences Centre.

Prerequisite(s): Consent of the Department.

Marketing MKTG

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Marketing 317 **3 units; H(3-3T)**

Foundations of Marketing
An introductory marketing course designed for management students to introduce the principles and practices of marketing. Topics will cover basic marketing concepts, societal issues, and the decision-making process of marketers in developing marketing strategies and plans. The focus of the course will be on the implementation of specific product, pricing, distribution and communication strategies for specific market situations.

Prerequisite(s): Admission to the Haskayne School of Business, and 30 units (5.0 full-course equivalents) including Business and Environment 291 or Strategy and Global Management 217.

Antirequisite(s): Credit for Marketing 317 and 341 will not be allowed.

Marketing 341 **3 units; H(3-0)**

Introduction to Marketing
An introductory marketing course designed for non-Management students to introduce the broad principles and practices of marketing from both an organizational and societal perspective. Topics will cover basic marketing concepts, societal issues, and the decision process of marketers in developing, pricing, promoting and distributing their products.

Antirequisite(s): Credit for Marketing 341 and 317 will not be allowed.

Note: Not available for credit towards the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Marketing 431 **3 units; H(3-0)**

Retail Management
A strategic approach to the retail industry. Managing the retail operation, including site selection, store design, consumer behaviour in retail situations, buying, inventory management, and visual merchandising. The role of retailing in the global economy.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 433 **3 units; H(3-0)**

Business-To-Business Marketing
Marketing management and theory applied to the purchase of products and services by organizations. Topics include industrial market dynamics, organizational buying behaviour, relationship development, technology, and the importance of innovation.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 435 **3 units; H(3-0)**

Marketing Communications
Evaluations of the roles of various communication tools including advertising, sales promotion, personal selling and public relations.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 449 **3 units; H(3-0)**

Sales Management
Strategic and managerial aspects of professional selling and sales force management. Topics

include sales forecasting, recruitment, training, motivation, compensation and territory management, CRM, integration of technology, sales professionalism/ethics.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 465 **3 units; H(3-0)**

Marketing Research
Understanding how to conduct and evaluate research for management decision making. Emphasis on research design, measurement concepts, sample design, field work, statistical concepts, data analysis and reporting research findings. Practical application by doing a field research study.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 467 **3 units; H(3-0)**

International Marketing
A course on the environment and basic principles underlying the design and implementation of marketing strategies across national and cross-cultural boundaries. Topics will follow the decision process of international marketers in researching the environment, planning the entry strategy and designing their activities on product, distribution, promotion and pricing.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 477 **3 units; H(3-0)**

Product Management
An in-depth examination of product management issues facing organizations. This includes strategic innovation, product portfolio, new product/service development, brand management, and diffusion of technology.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 479 **3 units; H(3-0)**

Management of Marketing Channels
Development and maintenance of relationships between firms and their channel partners with an emphasis on the competitive advantage that such relationships offer. Topics include strategic channel design, channel evaluation, the role of channel partners in product/service development demand forecasting, pricing for competitive advantage and inventory control.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 483 **3 units; H(3-0)**

Buyer Behaviour
Study of factors influencing buyer decision making and purchase behaviour. Topics include buyer motivation, personality, learning, and attitudes as well as the influence of culture, social class, groups, and situational contexts on buyers.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 487 **3 units; H(3-0)**

Services Marketing
Application of the managerial practices and theory related to services marketing. Topics include management and measurement of service quality, service recovery. The linking of customer measurement to performance measurement, and cross-function issues through integration of marketing with disciplines such as operations and human resources.

Prerequisite(s): Admission to the Haskayne School of Business and Marketing 317.

Marketing 493 **3 units; H(3-0)**

Strategic Marketing
Marketing strategy is explored in the context of overall corporate strategy. Integrates the aspects of the market mix into formal planning systems. The focus of the course is on strategic responses to changing customer needs and competitive activities.

Prerequisite(s): Admission to the Haskayne School of Business and 84 units (14.0 full-course equivalents) including Marketing 317.

Corequisite(s): Marketing 465.

Marketing 559 **3 units; H(3-0)**

Selected Topics in Marketing
Investigation of selected topics in Marketing.

Prerequisite(s): Admission to the Haskayne School of Business and 54 units (9.0 full-course equivalents) including Marketing 317.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Marketing 601 **3 units; H(3-0)**

Marketing Management
An introductory course on marketing management with an emphasis on the marketing concept as the focus of business strategy. The decision variables as well as functional frameworks used by marketing managers are emphasized by concentrating on the relationship between business and consumers.

Marketing 735 **3 units; H(3-0)**

Marketing Communications
Evaluation of strategic roles of a variety of communication disciplines - such as advertising, direct response advertising, sales promotion and public relations - and how companies combine those disciplines to provide clarity, consistency, and maximum impact.

Prerequisite(s): Marketing 601.

Marketing 741 **3 units; H(3-0)**

Business-To-Business Marketing
Management issues in the marketing of products and services to business, government and industrial customers. Topics include organizational buying behaviour, industrial market segmentation, demand analysis and sales forecasting, development and implementation of an industrial marketing mix.

Prerequisite(s): Marketing 601.

Marketing 761 **3 units; H(3-0)**

Buyer Behaviour
Study of factors influencing buyer decision-making processes and purchase behaviours, with implications for marketing practice.

Prerequisite(s): Marketing 601.

Marketing 763 **3 units; H(3-0)**

Marketing Research
Study of research as a process for gathering market information to aid problem solving. Steps in the research process reviewed include problem definition, research design, data collection, data analysis and report preparation.

Prerequisite(s): Marketing 601.

Marketing 783 **3 units; H(3-0)**

Services Marketing and Management
Study of processes and practices relevant to strategic firms using service for competitive advantage. Focuses on the integration of marketing, operations, and human resources from the consumer's perspective.

Prerequisite(s): Marketing 601.

Marketing 785 **3 units; H(3-0)**

New Venture Marketing
Within the context of high-potential, high growth ventures, examines four pillars of new product/new business opportunity. How to create value for the customer, solve significant problems through product and service design, measure sustainable financial value, and assess fit of new ideas with entrepreneur/organization. Emphasis on discovering market opportunities and exploring product or service feasibility.

Prerequisite(s): Marketing 601.

Marketing 789 **3 units; H(3S-0)**

Seminar in Marketing Management
Intensive study and discussion of current literature and research with respect to selected, advanced topics in marketing.

Prerequisite(s): Marketing 601 or consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Marketing 793 **3 units; H(3-0)**

Strategic Marketing
Strategic market planning in a corporate context. Developing marketing strategies and understanding implementation. Examining the market management process.

Prerequisite(s): Marketing 601.

Marketing 795 **3 units; H(3-0)**

International Marketing
Design and implementation of marketing strategies across countries. Focuses on the global marketing environment and decision issues on foreign market entry, local marketing and global management of marketing activities.

Prerequisite(s): Marketing 601.

Marketing 797 **3 units; H(3S-0)**

Advanced Seminar in Marketing
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

PhD Course

Marketing 799 **3 units; H(3S-0)**

Doctoral Seminars in Marketing
MAY BE REPEATED FOR CREDIT

Mathematics MATH

Instruction offered by members of the Department of Mathematics and Statistics in the Faculty of Science.

Notes:

For listings of related courses, see Actuarial Science, Applied Mathematics, Pure Mathematics, and Statistics.

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 replaces Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

Mathematics 113 **0.75 units; E(8 hours)**

Eigenvalues and Eigenvectors
A review of these particular topics for students who have completed Mathematics 211 or equivalent.

Note: Open to students with credit in Mathematics 211 or equivalent.

NOT INCLUDED IN GPA

Mathematics 177 **0.75 units; E(16 hours)**

Further Topics from Mathematics 277
Vector functions and differentiation, curves and parametrization, functions of several variables, partial differentiation, differentiability, implicit functions, extreme values.

Prerequisite(s): Mathematics 267.

Note: Designed to rectify a deficiency for those students whose Calculus I and II courses covered all the topics from Mathematics 265 and 267 but did not cover some of the topics on the calculus of functions of several variables from Mathematics 277.

NOT INCLUDED IN GPA

Junior Courses

Note: Students who have not studied mathematics for some time are strongly advised to review high school material thoroughly prior to registering in any junior level mathematics course.

Mathematics 205 **3 units; H(3-1)**

Mathematical Explorations
A mathematics appreciation course. Topics selected by the instructor to provide a contemporary mathematical perspective and experiences in mathematical thinking. May include historical material on the development of classical mathematical ideas as well as the evolution of recent mathematics.

Prerequisite(s): Mathematics 30-1, Mathematics 30-2, Pure Mathematics 30, Applied Mathematics 30, or Mathematics II (offered by Continuing Education).

Note: For students whose major interests lie outside the sciences. Highly recommended for students pursuing an Elementary School Education degree. It is not a prerequisite for any other course offered by the Department of Mathematics and Statistics, and cannot be used for credit towards any Major or Minor program in the Faculty of Science except for a major in General Mathematics.

Mathematics 211 **3 units; H(3-1T-1)**

Linear Methods I
Systems of equations and matrices, vectors, matrix representations and determinants. Complex numbers, polar form, eigenvalues, eigenvectors. Applications.

Prerequisite(s): A grade of 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30. (Alternatives are presented in C.1 Mathematics Diagnostic Test in the Academic Regulations section of this Calendar).

Antirequisite(s): Credit for Mathematics 211 and either 213 or 221 will not be allowed.

Mathematics 213 **3 units; H(3-1T-1)**

Honours Linear Algebra I
Systems of equations and matrices, vectors, linear transformations, determinants, eigenvalues and eigenvectors.

Prerequisite(s): A grade of 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30.

Antirequisite(s): Credit for Mathematics 213 and 211 will not be allowed.

Mathematics 249 **3 units; H(4-1T-1)**

Introductory Calculus
Algebraic operations. Functions and graphs. Limits, derivatives, and integrals of exponential, logarithmic and trigonometric functions. Fundamental theorem of calculus. Improper integrals. Applications.

Prerequisite(s): A grade of 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30. (Alternatives are presented in C.1 Mathematics Diagnostic Test in the Academic Regulations section of this Calendar).

Antirequisite(s): Not open to students with 60 per cent or higher in Mathematics 31 or a grade of "C" or higher in Mathematics 3 offered through University of Calgary Continuing Education, except with special departmental permission. Credit for Mathematics 249 and any one of Mathematics 251, 265, 275, 281, or Applied Mathematics 217 will not be allowed.

Mathematics 265 **3 units; H(3-1T-1)**

University Calculus I
Limits, derivatives, and integrals; the calculus of exponential, logarithmic, trigonometric and inverse trigonometric functions. Applications including curve sketching, optimization, exponential growth and decay, Taylor polynomials. Fundamental theorem of calculus. Improper integrals. Introduction to partial differentiation.

Prerequisite(s): A grade of 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30; and a grade of 50 per cent or higher in Mathematics 31 or a grade of "C" or higher in Mathematics 3 offered through University of Calgary Continuing Education. (Alternatives to Pure Mathematics 30 are presented in C.1 Mathematics Diagnostic Test in the Academic Regulations section of this Calendar).

Antirequisite(s): Credit for Mathematics 265 and any one of Mathematics 249, 251, 275, 281, or Applied Mathematics 217 will not be allowed.

Note: This course provides the basic techniques of differential calculus as motivated by various applications. Students performing sufficiently well in a placement test may be advised to transfer directly to Mathematics 267.

Mathematics 267 **3 units; H(3-1T-1)**

University Calculus II
Sequences and series, techniques of integration, multiple integration, applications; parametric equations.

Prerequisite(s): Mathematics 249 or 251 or 265 or 275 or 281 or Applied Mathematics 217.

Antirequisite(s): Credit for Mathematics 267 and any one of Mathematics 277, 349, or Applied Mathematics 219 will not be allowed.

Mathematics 271 **3 units; H(3-1T-1)**

Discrete Mathematics
Proof techniques. Sets and relations. Induction. Counting and probability. Graphs and trees.

Prerequisite(s): Mathematics 211.

Antirequisite(s): Credit for Mathematics 271 and 273 will not be allowed.

Mathematics 273 **3 units; H(3-1T-1)**

Honours Mathematics: Numbers and Proofs
Introduction to proofs. Functions, sets and relations. The integers: Euclidean division algorithm and prime factorization; induction and recursion; integers mod n. Real numbers: sequences of real numbers; completeness of the real numbers; open and closed sets. Complex numbers.

Prerequisite(s): A grade of 80 per cent or higher in Mathematics 30-1 or Pure Mathematics 30. (Alternatives are presented in C.1 Mathematics Diagnostic Test in the Academic Regulations section of this Calendar).

Antirequisite(s): Credit for Mathematics 273 and 271 will not be allowed.

Mathematics 275 **3 units; H(3-1T-1.5)**

Calculus for Engineers and Scientists
Calculus of functions of one real variable; derivative and Riemann integral; Mean Value Theorem; the Fundamental Theorem of Calculus; techniques of integration; Applications; Improper integrals; Power series, Taylor series.

Prerequisite(s): A grade of 70 per cent or higher in Pure Mathematics 30 or Mathematics 30-1; and credit in Mathematics 31 or Mathematics 3 offered through University of Calgary Continuing Education. Alternatively, admission to the Faculty of Engineering including credit in either Pure Mathematics 30 or Mathematics 30-1; and Mathematics 31 or Mathematics 3 offered through University of Calgary Continuing Education.

Antirequisite(s): Credit for Mathematics 275 and any one of Mathematics 249 or 251 or 265 or 281 or Applied Mathematics 217 will not be allowed.

Mathematics 277 **3 units; H(3-1T-1.5)**

Multivariable Calculus for Engineers and Scientists
Calculus of functions of several real variables; differentiation, implicit functions, double and triple integrals; applications; Vector-valued functions; derivatives and integrals; parametric curves.

Prerequisite(s): Mathematics 275 or Applied Mathematics 217.

Antirequisite(s): Credit for Mathematics 277 and any one of Mathematics 253 or 267 or 283 or Applied Mathematics 219 will not be allowed.

Senior Courses

Mathematics 311 **3 units; H(3-1T)**

Linear Methods II
Vector spaces and subspaces. Linear independence. Matrix representations of linear transformations. Gram-Schmidt orthogonalization. Students

will complete a project using a computer algebra system.

Prerequisite(s): Mathematics 211 or 213.

Antirequisite(s): Credit for Mathematics 311 and 313 will not be allowed.

Note: Mathematics 271 is highly recommended as a prerequisite.

Mathematics 313 **3 units; H(3-1T)**

Honours Linear Algebra II

Diagonalization. Canonical forms. Inner products, orthogonalization. Spectral theory. Students will be required to complete a project using a computer algebra system.

Prerequisite(s): Mathematics 213 or a grade of "B+" or better in Mathematics 211.

Antirequisite(s): Credit for Mathematics 311 and 313 will not be allowed.

Mathematics 331 **3 units; H(3-1T)**

Multivariate Calculus

Linear ordinary differential equations, and systems of ordinary differential equations. Calculus of functions of several variables. Introduction to vector analysis, theorems of Green, Gauss and Stokes.

Prerequisite(s): One of Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219; and Mathematics 211 or 213.

Antirequisite(s): Credit for Mathematics 331 and any of Mathematics 353 or 367 or 377 or 381 or Applied Mathematics 309 will not be allowed.

Note: This course is not a member of the list of courses constituting the fields of Actuarial Science, Applied Mathematics, Pure Mathematics, or Statistics and cannot normally be substituted for Mathematics 353 or 367 or 377 or 381 in degree programs in any of those fields.

Mathematics 335 **3 units; H(3-1T)**

Analysis I

The real numbers, sequences, series, functions, continuity and uniform continuity, differentiation, intermediate and mean value theorems, the Riemann integral, integrability of continuous functions on closed intervals.

Prerequisite(s): Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219.

Antirequisite(s): Credit for Mathematics 335 and any one of Mathematics 355, Pure Mathematics 435 or 455 will not be allowed.

Note: Students with a grade of "B+" or higher in Mathematics 267 or 277 are encouraged to consider taking Mathematics 355.

Mathematics 355 **3 units; H(3-1T)**

Honours Analysis I

The real numbers, sequences, series, functions, continuity and uniform continuity, differentiation, intermediate and mean value theorems, the Riemann integral, integrability of continuous functions on closed intervals.

Prerequisite(s): Mathematics 283 or 267 or 277; or a grade of "B+" or better in Mathematics 253 or Applied Mathematics 219.

Antirequisite(s): Credit for Mathematics 355 and any one of Mathematics 335, Pure Mathematics 435 or 455 will not be allowed.

Mathematics 367 **3 units; H(3-1T)**

University Calculus III

Functions of several variables; limits, continuity, differentiability, partial differentiation, applications including optimization and Lagrange multipliers. Vector functions, line integrals and surface integrals, Green's theorem, Stokes' theorem. Divergence theorem. Students will complete a project using a computer algebra system.

Prerequisite(s): One of Mathematics 267 or 283 or 349 or Applied Mathematics 219; and Mathematics 211 or 213.

Antirequisite(s): Credit for Mathematics 367 and any one of Mathematics 353, 331, 377, 381 or Applied Mathematics 309 will not be allowed.

Mathematics 375 **3 units; H(3-1.5T)**

Differential Equations for Engineers and Scientists

Definition, existence and uniqueness of solutions; first order and higher order equations and applications; Homogeneous systems; Laplace transform; partial differential equations of mathematical physics.

Prerequisite(s): Mathematics 211 or Applied Mathematics 219 or Mathematics 277; or both Mathematics 267 and 177; or both Mathematics 253 and 114.

Antirequisite(s): Credit for Mathematics 375 and either Applied Mathematics 307 or 311 will not be allowed.

Mathematics 377 **3 units; H(3-1.5T)**

Vector Calculus for Engineers and Scientists

Review of calculus of functions of several variables. Vector fields, line integrals, independence of path, Green's theorem; Surface integrals, divergence theorem, Stokes's theorem; applications; curvilinear co-ordinates; Laplace, diffusion and wave equations in three dimensional space.

Prerequisite(s): Mathematics 375.

Antirequisite(s): Credit for more than one of Mathematics 377, 331, 353, 367, 381 or Applied Mathematics 309 will not be allowed.

Mathematics 401 **3 units; H(3-0)**

Special Topics

Higher level topics which can be repeated for credit.

Prerequisite(s): Consent of the Department.

Note: This course is designed to add flexibility to completion of an undergraduate pure mathematics or general mathematics program.

MAY BE REPEATED FOR CREDIT

Mathematics 403 **3 units; H(3-0)**

Topics in Mathematics for Economics

Techniques of integration. Multiple integrals. Analysis of functions. Continuity. Compact sets. Convex sets. Separating hyperplanes. Lower and upper hemi-continuous correspondences. Fixed point theorems, Optimal control.

Prerequisite(s): Mathematics 211 or 213; and Mathematics 253 or 267 or 277 or 283 or Applied Mathematics 219. Alternatively, both Economics 387 and 389.

Mathematics 411 **3 units; H(3-1T)**

Linear Spaces with Applications

Canonical forms. Inner product spaces, invariant subspaces and spectral theory. Quadratic forms.

Prerequisite(s): Mathematics 311; and one of Mathematics 331, 353, 367, 377, 381 or Applied Mathematics 309.

Antirequisite(s): Credit for more than one of Mathematics 411, 313 or Applied Mathematics 441 will not be allowed.

Note: May not be offered every year. Consult the Department for listings.

Mathematics 421 **3 units; H(3-1T)**

Complex Analysis I

Basic complex analysis – complex numbers and functions, differentiation, Cauchy-Riemann equations, line integration, Cauchy's theorem and Cauchy's integral formula, Taylor's theorem, the residue theorem, applications to computation of definite integrals.

Prerequisite(s): Both Mathematics 349 and 353; or both Mathematics 283 and 381; or Mathematics 267.

Antirequisite(s): Credit for Mathematics 421 and any one of Mathematics 423, Pure Mathematics 421 or 521 will not be allowed.

Note: For students with credit in Mathematics 267, it is strongly recommended that they take Mathematics 367 before or while taking Mathematics 421.

Mathematics 423 **3 units; H(3-1T)**

Honours Complex Analysis

Basic complex analysis – complex numbers and functions, differentiation, Cauchy-Riemann equations, line integration, Cauchy's theorem and Cauchy's integral formula, Taylor's theorem, the residue theorem, applications to computation of definite integrals.

Prerequisite(s): Both Mathematics 349 and 353; or both Mathematics 283 and 381; or Mathematics 267.

Antirequisite(s): Credit for Mathematics 423 and any one of Mathematics 421, Pure Mathematics 421 or 521 will not be allowed.

Note: Open only to Honours Applied Mathematics and Honours Pure Mathematics students. For students with credit in Mathematics 267 it is strongly recommended that they take Mathematics 367 before or while taking Mathematics 423.

Mathematics 445 **3 units; H(3-0)**

Analysis II

Basic topology of Euclidean space, Fubini's theorem, the total derivative, change of variable in multiple integrals, inverse and implicit function theorems, submanifolds of Euclidean spaces, differential forms, Stokes' theorem in arbitrary dimension.

Prerequisite(s): Mathematics 353 or 367 or 377 or 381 or Applied Mathematics 309; and Mathematics 311 or 313; and Mathematics 335 or 355 or Pure Mathematics 435 or 455.

Antirequisite(s): Credit for Mathematics 445 and either Mathematics 447 or Pure Mathematics 545 will not be allowed.

Mathematics 447 **3 units; H(3-0)**

Honours Analysis II

Basic topology of Euclidean space, Fubini's theorem, the total derivative, change of variable in multiple integrals, inverse and implicit function theorems, submanifolds of Euclidean spaces, differential forms, Stokes' theorem in arbitrary dimension.

Prerequisite(s): Mathematics 367 or 377 or 381 or Applied Mathematics 309 or "B+" or higher in Mathematics 353; and Mathematics 313 or "B+" or higher in Mathematics 311; and Mathematics 355 or Pure Mathematics 455 or "B+" or higher in Mathematics 335 or Pure Mathematics 435. Alternatively, consent of the Department.

Antirequisite(s): Credit for Mathematics 447 and either Mathematics 445 or Pure Mathematics 545 will not be allowed.

Mathematics 501 **3 units; H(3-0)**

Measure and Integration
Abstract measure theory, basic integration theorems, Fubini's theorem, Radon-Nikodym theorem, Lp Spaces, Riesz representation theorems.

Prerequisite(s): Mathematics 545 or Pure Mathematics 545.

Antirequisite(s): Credit for Mathematics 501 and any one of Mathematics 601, Pure Mathematics 501 or 601 will not be allowed.

Mathematics 521 **3 units; H(3-0)**

Complex Analysis II
Analytic functions as mappings, local properties of analytic functions, Schwarz lemma, Casorati-Weierstrass and Picard theorems, analytic continuation, harmonic and subharmonic functions, approximation theorems, conformal mappings, Riemann surfaces.

Prerequisite(s): Mathematics 335 or 355 or Pure Mathematics 435 or 455; and Mathematics 421 or 423 or Pure Mathematics 421.

Antirequisite(s): Credit for Mathematics 521 and Pure Mathematics 521 will not be allowed.

Mathematics 545 **3 units; H(3-0)**

Analysis III
Sequences and series of functions; Lebesgue integration on the line, Fourier series and the Fourier transform, pointwise convergence theorems, distributions and generalized functions.

Prerequisite(s): Mathematics 447 or a grade of "B+" or better in Pure Mathematics 445 or Mathematics 445.

Antirequisite(s): Credit for Mathematics 545 and Pure Mathematics 545 will not be allowed.

Graduate Courses

Note: In addition to the prerequisites listed below, consent of the Applied Mathematics Department or the Pure Mathematics Department is a prerequisite for these graduate courses.

Mathematics 600 **1.5 units; Q(3S-0)**

Research Seminar
A professional skills course, focusing on the development of technical proficiencies that are essential to succeed as practicing mathematicians in academia, government, or industry. The emphasis is on delivering professional presentations and using modern mathematical research tools. A high level of active student participation is required.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Mathematics 601 **3 units; H(3-0)**

Measure and Integration
Abstract measure theory, basic integration theorems, Fubini's theorem, Radon-Nikodym theorem, Lp spaces, Riesz representation theorem.

Prerequisite(s): Mathematics 545 or Pure Mathematics 545.

Antirequisite(s): Credit for more than one of Mathematics 501, 601, Pure Mathematics 501 and 601 will not be allowed.

Mathematics 603 **3 units; H(3-0)**

Analysis III
Sequences and series of functions; Lebesgue integration on the line, Fourier series and the Fourier transform, pointwise convergence theorems, distributions and generalized functions.

Prerequisite(s): Mathematics 447 or a grade of "B+" or better in Pure Mathematics 445 or Mathematics 445.

Antirequisite(s): Credit for Mathematics 603 and either Mathematics 545 or Pure Mathematics 545 will not be allowed.

Mathematics 605 **3 units; H(3-0)**

Differential Equations III
Systems of ordinary differential equations. Existence and uniqueness. Introduction to partial differential equations.

Prerequisite(s): Applied Mathematics 411 and Pure Mathematics 445 or 545 or equivalents.

Antirequisite(s): Credit for Mathematics 605 and Applied Mathematics 605 will not be allowed.

Mathematics 607 **3 units; H(3-0)**
(formerly Pure Mathematics 611)

Algebra III
A sophisticated introduction to modules over rings, especially commutative rings with identity. Major topics include: snake lemma; free modules; tensor product; hom-tensor duality; finitely presented modules; invariant factors; free resolutions; and the classification of finitely generated modules over principal ideal domains. Adjoint functors play a large role. The course includes applications to linear algebra, including rational canonical form and Jordan canonical form.

Prerequisite(s): Pure Mathematics 431 or Mathematics 411. Pure Mathematics 431 is recommended.

Antirequisite(s): Credit for more than one of Pure Mathematics 511, 611 and Mathematics 607 will not be allowed.

Mathematics 617 **3 units; H(3-0)**
(formerly Applied Mathematics 617)

Functional Analysis
Introduction to some basic aspects of Functional Analysis, Hilbert and Banach spaces, linear operators, weak topologies, and the operator spectrum.

Prerequisite(s): Mathematics 545 or Mathematics 603.

Note: Credit for more than one of Applied Mathematics 617 and Pure Mathematics 617 and Mathematics 617 will not be allowed.

Mathematics 621 **3 units; H(3-0)**

Complex Analysis
A rigorous study of function of a single complex variable. Holomorphic function, Cauchy integral formula and its applications. Conformal mappings. Fractional linear transformations. Argument principle. Schwarz lemma. Conformal self-maps of the unit disk.

Prerequisite(s): Mathematics 335 or 355 or Pure Mathematics 435 or 455.

Mathematics 625 **3 units; H(3-0)**

Introduction to Algebraic Topology
Introduction to the algebraic invariants that distinguish topological spaces. Focuses on the fundamental group and its applications, and homology. Introduction to the basics of homological algebra.

Prerequisite(s): Pure Mathematics 505 and Pure Mathematics 431.

Antirequisite(s): Credit for Pure Mathematics 607 and Mathematics 625 will not be allowed.

Mathematics 627 **3 units; H(3-0)**

Algebraic Geometry
The objective of this course is to provide an introduction to modern algebraic geometry sufficient to allow students to read research papers in their fields which use the language of schemes. Topics will include Spectra of rings; the Zariski topology; affine schemes; sheaves; ringed spaces; schemes; morphisms of finite type; arithmetic schemes; varieties; projective varieties; finite morphisms, unramified morphisms; etale morphisms.

Prerequisite(s): Mathematics 607.

Mathematics 631 **3 units; H(3-0)**

Discrete Mathematics
Discrete Geometry: Euclidean, spherical and hyperbolic n-spaces, trigonometry, isometries, convex sets, convex polytopes, (mixed) volume(s), classical discrete groups, tilings, isoperimetric inequalities, packings, coverings. Graph Theory: connectivity; trees; Euler trails and tours; Hamilton cycles and paths; matchings; edge colourings; vertex colourings; homomorphisms; plane and planar graphs; extremal graph theory and Ramsey theory.

631.01. Discrete Geometry

631.03. Graph Theory

Prerequisite(s): Consent of the Department.

Mathematics 635 **3 units; H(3-0)**

Geometry of Numbers
The interplay of the group-theoretic notion of lattice and the geometric concept of convex set, the lattices representing periodicity, the convex sets geometry. Topics include convex bodies and lattice points, the critical determinant, the covering constant and the inhomogeneous determinant of a set, Star bodies, methods related to the above, and homogeneous and inhomogeneous forms.

Prerequisite(s): Consent of the Department.

Mathematics 637 **3 units; H(3-0)**

Infinite Combinatorics
An excursion into the infinite world, from Ramsey Theory on the natural numbers, to applications in Number Theory and Banach Spaces, introduction to tools in Model Theory and Logic, fascinating homogeneous structures such as the rationals and the Rado graph, and possibly further explorations into the larger infinite world.

Prerequisite(s): Consent of the Department.

Mathematics 641 **3 units; H(3-0)**

Number Theory
Algebraic Number Theory: an introduction to number fields, rings of integers, ideals, unique factorization, the different and the discriminant. The main objective to the course will be to prove the finiteness of the class number and Dirichlet's Unit Theorem.

Analytic Number Theory: students will learn tools to aid in the study of the average behavior of arithmetic functions, including the use of zeta functions, to prove results about the distribution of prime numbers.

641.01. Algebraic Number Theory

641.03. Analytic Number Theory

Prerequisite(s): Consent of the Department.

Note: Mathematics 607 is recommended as preparation for Mathematics 641.01, but not required. Mathematics 421 or equivalent is recommended as preparation for 641.03.

Mathematics 643 **3 units; H(3-0)**

Computational Number Theory
An investigation of major problems in computational number theory, with emphasis on practical techniques and their computational complexity. Topics include basic integer arithmetic algorithms, finite fields, primality proving, factoring methods, algorithms in algebraic number fields.

Prerequisite(s): Pure Mathematics 427 or 429.

Antirequisite(s): Credit for more than one of Pure Mathematics 527, 627 and Mathematics 643 will not be allowed.

Mathematics 647 **3 units; H(3-0)**

Modular Forms
Modular forms and automorphic representations and their L-functions. Modularity Theorem from two perspectives.

Classical Perspective on Modular Forms: introduction to modular curves as moduli spaces for elliptic curves and as differential forms on modular curves. A study of L-functions attached to modular forms and the modularity theorem.

An Introduction to Automorphic Representations: introduction to the Langlands Programme. A study of partial L-functions attached to automorphic representations and known instances of the Langlands Correspondence.

647.01. Classical Perspective on Modular Forms

647.03. An Introduction to Automorphic Representations

Prerequisite(s): Mathematics 607.

Mathematics 651 **3 units; H(3-0)**
(formerly Applied Mathematics 603)

Topics in Applied Mathematics
Topics will be chosen according to the interest of the instructors and students.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Mathematics 653 **3 units; H(3-0)**
(formerly Pure Mathematics 603)

Topics in Pure Mathematics
Topics will be chosen according to the interest of the instructors and students.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Mathematics 661 **3 units; H(3-0)**

Scientific Modelling and Computation I
The Convex Optimization: an introduction to modern convex optimization, including basics of convex analysis and duality, linear conic programming, robust optimization, and applications.

Scientific Computation: an introduction to both the methodological and the implementation components underlying the modern scientific computations with the natural emphasis on linear algebra, including modern computing architecture and its implications for the numerical algorithms.

Numerical Differential Equations: fundamentals of solving DEs numerically addressing the existence, stability and efficiency of such methods.

661.01. Convex Optimization

661.03. Scientific Computation

661.05. Numerical Differential Equations

Prerequisite(s): Consent of the Department.

Note: Mathematics 603 is recommended as preparation for Mathematics 661.01.

Mathematics 663 **3 units; H(3-0)**

Applied Analysis
Interior Point Methods: exposes students to the modern IPM theory with some applications, to the extent that at the end of the course a student should be able to implement a basic IPM algorithm.

Theoretical Numerical Analysis: provides the theoretical underpinnings for the analysis of modern numerical methods, covering topics such as linear operators on normed spaces, approximation theory, nonlinear equations in Banach spaces, Fourier analysis, Sobolev spaces and weak formulations of elliptic boundary value problems, with applications to finite difference, finite element and wavelet methods.

Differential Equations: essential ideas relating to the analysis of differential equations from a functional analysis point of view. General topics include Hilbert spaces and the Lax-Milgram's theorem, variational formulation of boundary value problems, finite element methods, Sobolev spaces, distributions, and pseudo-differential operators.

663.01. Interior Point Methods

663.03. Theoretical Numerical Analysis

663.05. Differential Equations

Prerequisite(s): Two of Mathematics 601, 603 and 605.

Note: Mathematics 601, 603 and 605 are recommended as preparation for this course. Additionally, Mathematics 661.01 and Mathematics 617 are recommended for Mathematics 663.01.

Mathematics 667 **3 units; H(3-0)**

Introduction to Quantum Information
Focus on the mathematical treatment of a broad range of topics in quantum Shannon theory. Topics include quantum states, quantum channels, quantum measurements, completely positive maps, Neumarkís theorem, Stinespring dilation theorem, Choi-Jamiolkowski isomorphism, the theory of majorization and entanglement, the Peres-Horodecki criterion for separability, Shannon's noiseless and noisy channel coding theorems, Lieb's theorem and the strong subadditivity of the von Neumann entropy, Schumacher's quantum noiseless channel coding theorem, and the Holevo-Schumacher-Westmoreland theorem.

Prerequisite(s): Applied Mathematics 411 or Physics 443.

Mathematics 669 **3 units; H(3-0)**

Scientific Modelling and Computation II
Wavelet Analysis: covers the design and implementation of wavelet methods for modern signal processing, particularly for one- and two-dimensional signals (audio and images).

Mathematical Biology: introduction to discrete models of mathematical biology, including difference equations, models of population dynamics and the like. Topics include stability of models describe by difference equations, continuous spatially homogeneous processes and spatially distributed models.

669.01. Wavelet Analysis

669.03. Mathematical Biology

Prerequisite(s): Mathematics 617 is required for Mathematics 669.01. Consent of the Department for Mathematics 669.03.

Mathematics 681 **3 units; H(3-0)**
(formerly Applied Mathematics 681)

Stochastic Calculus for Finance
Martingales in discrete and continuous time, risk-neutral valuations, discrete- and continuous-time (B,S)-security markets, the Cox-Ross-Rubinstein formula, Wiener and Poisson processes, Itô's formula, stochastic differential equations, Girsanov's theorem, the Black-Scholes and Merton formulas, stopping times and American options, stochastic interest rates and their derivatives, energy and commodity models and derivatives, value-at-risk and risk management.

Prerequisite(s): Applied Mathematics 481.

Antirequisite(s): Credit for more than one of Mathematics 681, Applied Mathematics 681 and 581 will not be allowed.

Mathematics 683 **3 units; H(3-0)**
(formerly Applied Mathematics 683)

Computational Finance
Basic computational techniques required for expertise quantitative finance. Topics include basic econometric techniques (model calibration), tree-based methods, finite-difference methods, Fourier methods, Monte Carlo simulation and quasi-Monte Carlo methods.

Prerequisite(s): Applied Mathematics 481 and 491.

Antirequisite(s): Credit for more than one of Applied Mathematics 683, 583 and Mathematics 683 will not be allowed.

Note: Although a brief review of asset price and option valuation models is included, it is recommended that students take Mathematics 681 prior to taking this course.

Mathematics 685 **3 units; H(3-0)**

Stochastic Processes
Stochastic processes are fundamental to the study of mathematical finance, but are also of vital importance in many other areas, from neuroscience to electrical engineering. Topics to be covered: Elements of stochastic processes, Markov chains and processes, Renewal processes, Martingales (discrete and continuous times), Brownian motion, Branching processes, Stationary processes, Diffusion processes, The Feynman-Kac formula, Kolmogorov backward/forward equations, Dynkin's formula.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for Statistics 761 and Mathematics 685 will not be allowed.

Mathematics 691 **3 units; H(3-0)**

Advanced Mathematical Finance I
Topics include specific areas of mathematical finance and build on Mathematics 681. Lévy Processes (LP): fundamental concepts associated with LP such as infinite divisibility, the Lévy-Khintchine formula, the Lévy-Itô decomposition, subordinators, LP as time-changed Brownian motions, and also dealing with semi-groups and generators of LP, the Itô formula for LP, the Girsanov theorem, stochastic differential equations driven by LP, the Feynman-Kac formula, applications of LP and numerical simulation of LP. Credit Risk: corporate bond markets, modelling the bankruptcy risk of a firm, and understanding how corporate bonds are priced.

691.01. Lévy Processes

691.03. Credit Risk

Prerequisite(s): Mathematics 681.

Mathematics 693 **3 units; H(3-0)**

Advanced Mathematical Finance II
Topics include specific areas of mathematical finance and build on Mathematics 681 and 683. Monte Carlo Methods for Quantitative Finance: random number generation, simulation of stochastic differential equations, option valuation,

variance reduction techniques, quasi-Monte Carlo methods, computing 'greeks', valuation of path-dependent and early-exercise options; applications to risk management; Markov Chain Monte Carlo methods. Energy, Commodity and Environmental Finance: energy and commodity markets; spot, futures, forwards and swap contracts; the theory of storage; stochastic models for energy prices; model calibration; emissions market modelling; weather derivatives; energy risk management; energy option valuation.

693.01 Monte Carlo Methods for Quantitative Finance

693.03 Energy, Commodity and Environmental Finance

Prerequisite(s): Mathematics 681 and 683.

Mechanical Engineering ENME

Instruction offered by members of the Department of Mechanical and Manufacturing Engineering in the Schulich School of Engineering.

Mechanical Engineering 101
3 units; H(32 hours)
(formerly Mechanical Engineering 001)

Mechanical and Manufacturing Engineering Block Course
Special topics in Mechanical and Manufacturing Engineering. Research and industry presentations, software training, informational sessions, and field trips as resources permit.

Note: Presented during block week in the Fall Term over 4 days. All Mechanical and Manufacturing Engineering students must complete this course prior to entry to their third year of studies.

NOT INCLUDED IN GPA

Senior Courses

Mechanical Engineering 337 3 units; H(3-2)

Computing Tools for Engineering Design
Application of high-level software to the solution of design problems. Evaluation and validation of alternate solution approaches. Numeric and symbolic computation, visualization, data analysis, model-based analysis. Topics will be derived from real engineering problems.

Prerequisite(s): Engineering 233.

Mechanical Engineering 339 3 units; H(3-2)

Engineering Graphics and CAD
Technical sketching. Orthographic projections. Multiviews, auxiliary views and section views. Dimensions and tolerances. Working drawings. Design applications. Computer-Aided Design (CAD) software is used for 3-D modelling and 2-D drawing.

Prerequisite(s): Engineering 233.

Mechanical Engineering 341 3 units; H(3-1.5T-3/2)

Fundamentals of Fluid Mechanics
Basic principles of mechanics of fluids. Fluid statics: forces on surfaces, buoyancy, stability. Continuity, energy and momentum equations applied to control-volume analysis. Dimensional analysis and physical similarity. Introduction to external flows and flow through pipes. Applications to a variety of problems in mechanical engineering.

Prerequisite(s): Engineering 201 and 349 and Applied Mathematics 219 or Mathematics 277.

Mechanical Engineering 421
3 units; H(3-1T-3/2)

Materials I
Fundamentals of materials science with emphasis on the structure of materials and structure/property relationships: atomistic models; equilibrium phase diagrams; kinetics and non-equilibrium transformation diagrams; thermal-mechanical processing; microstructure formation and control; ductility mechanisms; material selection; and an introduction to fracture.

Prerequisite(s): Engineering 311.

Mechanical Engineering 461
3 units; H(3-1T-3/2)

Foundations of Mechatronics
Modelling analysis and design of dynamic systems, including mechanical, electrical, electromechanical, fluidic, thermal, and mixed systems Response of linear time-invariant systems to time and frequency outputs. Performance analysis and design to meet performance specifications Analysis and design of sensors and actuators. Application to feedback control of dynamic systems.

Prerequisite(s): Engineering 225 and 349.

Mechanical Engineering 471 3 units; H(3-2/2)

Heat Transfer
Modes of heat transfer; conduction, convection, radiation. Conduction in plane walls and cylinders. Conduction-convection systems, fins. Principles of convection. Empirical and practical relations for forced convection heat transfer. Natural convection. Condensation and boiling heat transfer. Heat exchangers. The log-mean temperature difference method.

Prerequisite(s): Engineering 311 and one of Mechanical Engineering 341 or Energy Engineering 480.

Mechanical Engineering 473 3 units; H(3-1T)

Fundamentals of Kinematics and Dynamics of Machines
Basic mechanisms and linkages in machinery. Position, velocity, acceleration and dynamic forces in planar mechanisms. Cam design and dynamic analysis. Gears and gear trains. Planetary trains.

Prerequisite(s): Engineering 349.

Mechanical Engineering 479
3 units; H(3-1T-3/2)

Mechanics of Materials
Analysis of stress and strain. Transformation, Equilibrium and compatibility equations, and boundary conditions. Constitutive behaviour of materials. Elasticity, viscoelasticity and plasticity. Flow rule. Two-dimensional problems in linear elasticity. Airy stress function. Axial symmetry. Failure criteria for ductile and brittle materials. Principle of virtual work and energy methods. The Rayleigh-Ritz and the finite element numerical methods in solid mechanics.

Prerequisite(s): Engineering 317.

Mechanical Engineering 485 3 units; H(3-3/2)

Mechanical Engineering Thermodynamics
Review of fundamentals; thermodynamic properties; flow and non-flow processes; Carnot cycle; Rankine cycle including reheat and regeneration. Engine gas cycles including simple gas turbines; gas turbines with reheat, intercooling and heat exchange. Reciprocating air compressors and expanders. Applications of humidity considerations; heat-pump and refrigeration cycles and their performance criteria. Combustion processes, chemical equilibrium, dissociation.

Prerequisite(s): Engineering 311.

Mechanical Engineering 493 3 units; H(3-1T)

Machine Component Design
Introduction to the principles of machine component design. Design for stiffness, strength, and endurance. Surface contacts, wear, and lubrication. Tolerances and fits. Design and selection of mechanical elements such as shafts, bolted joints, welded joints, hydrodynamic bearings, ball and roller bearings, gears, belts, brakes, clutches, and springs.

Prerequisite(s): Engineering 317.

Mechanical Engineering 495
3 units; H(3-1T-3/2)

Fluid Mechanics
Control volume methodology for multi-dimensional systems as applied to conservation principles (mass, linear and angular momentum); Navier-Stokes equations applied to pipe and boundary layer flows; basic principles of potential flow theory and aerodynamics and an introduction to compressible flow (convergent-divergent channels and normal shocks).

Prerequisite(s): Engineering 311 and Mechanical Engineering 341.

Mechanical Engineering 505 3 units; H(3-3/2)

Robotics
Kinematics, statics, dynamics and control of robot arms. Robot actuators, drives, sensors, and vision. Applications of robots.

Prerequisite(s): Mechanical Engineering 473 or Energy Engineering 460.

Mechanical Engineering 519 3 units; H(3-2)

Special Topics in Mechanical Engineering
Advanced topics in Mechanical Engineering.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Mechanical Engineering 521 3 units; H(3-3/2)

Materials II
Fundamentals and applications of materials science to engineering design: welding metallurgy; deformation and strength behaviour of real materials; failure analysis; fibre reinforced composites; fracture mechanics; fatigue; and creep.

Prerequisite(s): Mechanical Engineering 421.

Note: Completion of Mechanical Engineering 479 and 493 prior to this course will be of definite advantage.

Mechanical Engineering 523 3 units; H(3-2)

Biomechanics of Joints
Introduction to musculoskeletal biomechanics, including experimental and analytical approaches to movement analysis, experimental instrumentation and devices, and joint dynamics. Analysis of the contribution of external loading, forces generated by muscles and constraints provided by other musculoskeletal structures to predict forces and stresses in musculoskeletal joints and tissues. Numerical and modelling approaches, including inverse dynamics, and optimization, and determination of segmental inertial properties. Applications in orthopaedic engineering, movement assessment, ergonomics and joint injury and replacements.

Prerequisite(s): Fourth year standing.

Mechanical Engineering 538 6 units; F(3-4)

Mechanical Engineering Design Methodology and Application

Preliminary and detailed engineering design of a product or system with the emphasis on the design process as it is associated with mechanical and manufacturing engineering. Topics include design methodology and general design principles for engineers, project management, decision making processes, reliability and robust design, embodiment, detailed drawing and product life-cycle design. A team-based design project may be sponsored by industry or the Department. Also, an emphasis is given to project management and technical communication, including presentations to a committee from the Department and/or industry.

Prerequisite(s): Mechanical Engineering 421, 461, 471, 473, 479, 485, 493, 495 and Manufacturing Engineering 417.

Note: Concurrent enrolment in Mechanical Engineering 538 and one or more of Internship 513.01, 513.02, 513.03, and 513.04 will not be allowed.

Mechanical Engineering 547 3 units; H(3-2)

Finite Element Method

Review of basic concepts in the Theory of Elasticity. Stress, strain, equilibrium. Stress-strain relations. The principle of virtual work and its use in deriving exact and approximate equilibrium equations. Example: beam theory. Matrix analysis of framed structures. The stiffness method. The finite element method and other discretization procedures. The 4-node plane stress rectangular element. Shape functions. Derivation of stiffness matrix by means of the principle of virtual work. Isoparametric elements, completeness. Numerical integration of scheme. Programming Considerations. Solution of problems with the aid of a computer. Additional topics: Dynamics, heat transfer, fluid dynamics.

Prerequisite(s): Mechanical Engineering 479.

Mechanical Engineering 560 6 units; F(1-3)

Mechatronics Design Laboratory

A hands-on laboratory experience in the design and analysis of microprocessor-controlled electro-mechanical components. Emphasis will be on laboratory projects in which teams of students will configure, design, and implement mechatronic systems. Laboratories cover topics such as aliasing, quantization, electronic feedback, power amplifiers, digital logic, encoder interfacing, and motor control leading to prototyping and design of commercially viable products. Lectures will cover comparative surveys, operational principles, and integrated design issues associated with the spectrum of mechanism, electronics, and control components.

Prerequisite(s): Mechanical Engineering 461.

Mechanical Engineering 583 3 units; H(3-2)

Mechanical Systems in Buildings

Fundamentals of heating, ventilating, and air conditioning systems in buildings. Heating and cooling loads. Codes, regulations, and standards. System selection, generation equipment, heat exchangers, distribution and driving systems, terminal units, controls and accessories, and cost estimating. Energy efficiency and renewable energy applications. Elevators and escalators. Lifting devices. Sewage systems.

Prerequisite(s): Mechanical Engineering 471 and one of Mechanical Engineering 485 or Energy Engineering 560.

Mechanical Engineering 585 3 units; H(3-1T-3/2)

Control Systems

Modelling of physical systems; feedback control; stability; performance specification in the time and frequency domains; root locus plots; Bode and Nyquist plots; Proportional/Integral/Derivative (PID) control and dynamic compensation.

Prerequisite(s): Mechanical Engineering 461.

Mechanical Engineering 595 3 units; H(3-1T-3/2)

Gas Dynamics

Fundamentals of one-dimensional gas dynamics. Isentropic and non-isentropic flows, applications of dynamical similarity to shock waves. Oblique shocks, supersonic nozzles, flows with friction or heat transfer. Introduction to computational fluid dynamics (CFD).

Prerequisite(s): Mechanical Engineering 495.

Mechanical Engineering 597 3 units; H(3-1T-3/2)

Turbomachinery

Performance of turbomachines, machine selection, Reynolds number and scale effects. Two dimensional flow in turbomachines, degree of reaction and vector diagrams; flow irreversibilities and loss coefficients; pump, compressor and turbine efficiencies. Design of pumps, fans, centrifugal compressors, axial-flow compressors, and axial-flow turbines. Combination of machines with pipes or ducts.

Prerequisite(s): Mechanical Engineering 485 and 495.

Mechanical Engineering 599 3 units; H(3-2/2)

Vibrations and Machine Dynamics

Linear vibration theory: free and forced vibration of single- and multi- degree-of-freedom systems; damping in machines; vibration absorbers; experimental modal analysis. Balance of rotating machinery: sources of unbalance, rigid rotors, flexible rotors, critical speeds, balancing principles. Lagrange equations: application to mechanical systems.

Prerequisite(s): Mechanical Engineering 473 or Energy Engineering 460.

Graduate Courses

Mechanical Engineering 603 3 units; H(3-0)

Physical Fluid Dynamics

Physical phenomena of incompressible fluid motion for a variety of flows, e.g. pipe and channel flow, flow past a cylinder, and convection in horizontal layers. The derivation of the basic equations of fluid mechanics using Cartesian tensor notation. High and low Reynolds number flows including some solutions of the viscous flow equations, inviscid flow, and elementary boundary layer theory. Thermal free convective flows.

Mechanical Engineering 605 3 units; H(3-0)

Combustion Processes

Review of thermodynamics and chemical kinetics of combustion. Fluid mechanics, heat and mass transfer in combustion phenomena. Autoignition and source ignition, flames and detonation. Quenching and explosion hazards, flammability and detonation limits. Heterogeneous combustion, combustion practical systems, combustion as affecting pollution and efficiency, some experimental combustion methods.

Mechanical Engineering 607 3 units; H(3-0)

Mechanics of Compressible Flow

One-dimensional steady and unsteady motion with application to the analysis of supersonic nozzles, diffusers, flow in conduits with friction, shock tubes. Two-dimensional flow of ideal fluid. Small perturbation theory, method of characteristics with application to design of supersonic nozzles. Waves in two-dimensional flow.

Mechanical Engineering 613 3 units; H(3S-0)

Research Seminar I

Reports on studies of the literature or of current research. This course is compulsory for all MSc and thesis-route MEng students and must be completed before the thesis defence.

NOT INCLUDED IN GPA

Mechanical Engineering 615 3 units; H(3-0)

Instrumentation

Basic principles relating to measurement systems. Static and dynamic characteristics of signals. Measurement system behavior. Application of probability and statistics to measurement systems. Uncertainty analysis. Data acquisition: analog/digital devices and sampling theory. Application of theory to various measurement systems such as pressure, velocity, strain, concentration, temperature.

Mechanical Engineering 619 3 units; H(3-0)

Special Problems

Designed to provide graduate students, especially at the PhD level, with the opportunity of pursuing advanced studies in particular areas under the direction of a faculty member. Students would be required to consider problems of an advanced nature.

MAY BE REPEATED FOR CREDIT

Mechanical Engineering 631 3 units; H(3-0)

Numerical Methods for Engineers

Introduction, mathematical modelling, sources of errors in the process of numerical analysis and solution methodology; Elements of numerical analysis, Taylor series, round-off error, truncation error, concept of stability, consistency and convergence; Linear algebra, normal forms, Gauss elimination method, LU-decomposition, tridiagonal systems of equations; iterative methods, Jacobi, Gauss-Seidel, SOR, SSOR methods, conjugate gradient methods and preconditioning and principles of the multi-grid methods; Elliptic "equilibrium" equation, Laplace and Poisson equations, finite difference and finite control volume concepts and stability analysis; Parabolic equations: explicit, implicit and Crank-Nicolson methods, time-splitting method, method of lines, Stability analysis; Hyperbolic equations; Introduction to other methods; future challenging problems.

Mechanical Engineering 633 3 units; H(3-0)

Mathematical Techniques for Engineers

Application of mathematical techniques to the solution of ordinary and partial differential equations arising in engineering problems. Methods that will be considered are: separation of variables, method of characteristics, transform methods and complex variable methods.

Mechanical Engineering 637 3 units; H(3-0)
(Environmental Engineering 673)

Thermal Systems Analysis

Fundamentals of thermodynamics, fluid mechanics and heat transfer; thermal and energy systems, heat exchangers, co-generation; Second law of thermodynamics and concept of entropy genera-

tion and thermo-economics; Environmental issues and pollution control; Renewable energy system; Co-generation design; Heat exchanger design; Energy storage systems; Optimization process.

Mechanical Engineering 639 3 units; H(3-0)

Numerical Methods for Computational Fluid Dynamics
Review of solution techniques for ordinary differential equations. Stability, consistency and convergence. Order of accuracy. Fourier methods for stability. Numerical techniques for one-, two- and three-dimensional linear parabolic problems. Courant condition. Implicit and semi-implicit schemes. Boundary conditions for parabolic problems. Techniques for linear hyperbolic problems. CFL condition. Characteristics, domain of dependence and domain of influence. Boundary conditions for hyperbolic problems. Non-linear conservation laws. The Burger's equation as a test problem. Strong and weak solutions. Conservative and integral forms. Conservative schemes. Entropy condition. Godunov theorem and flux limiters. Godunov, ENO and TVD schemes. Implementation in gas dynamics.

Mechanical Engineering 641 3 units; H(3-0)

Advanced Control Systems
Introduction to multivariable systems; state space models; analysis of linear systems; stability; Cayley-Hamilton theorem; controllability and observability; state feedback control; pole placement designs; introduction to linear optimal control and estimation; Kalman filtering; separation theorem and duality; performance specifications; controller reduction concepts; introduction to robust control.

Mechanical Engineering 643 3 units; H(3-0)

Optimal and Adaptive Control
Discrete time and sampled-data system models and properties; discrete time domain controller design principles; system identification using least-squares analysis; self-tuning control; indirect adaptive control; model reference adaptive control; sliding mode control in continuous and discrete time; optimal design of sliding mode controllers; sensitivity functions and their role in control theoretic performance specification; robust stability and robust performance objectives; Kharitonov stability.

Mechanical Engineering 650 3 units; H(3-0)

Mobile Robotics
Overview of Unmanned vehicles, Mobile robot locomotion systems, Wheeled rovers, Walking machines, Mobile-manipulators, Mobile robot sensors and actuators, Simulation, modelling and analysis of mobile robot behaviour, Robot-environment interaction analysis, 2D navigation techniques and localization, Mobile robot simulation tools.

Prerequisite(s): Mechanical Engineering 505.

Mechanical Engineering 653 3 units; H(3-0)

Continuum Mechanics in Engineering
Review of linear algebra and tensor analysis; kinematics of the deformation; deformation and strain tensors; strain rates; balance equations and equations of motion; stress principle; stress power and conjugated stress-strain couples; stress rates; elements of Lagrangian and Hamiltonian Mechanics for discrete and continuum systems; thermomechanics and constitutive theory; isotropic and anisotropic hyperelasticity; composite materials.

Mechanical Engineering 660 (Mechanical Engineering 560) 6 units; F(0-3)

Mechatronics Design Laboratory
A hands-on laboratory experience in the design and analysis of microprocessor-controlled electromechanical components. Laboratory projects in which teams will configure, design, and implement mechatronic systems. Aliasing, quantization, electronic feedback, power amplifiers, digital logic, encoder interfacing, and motor control leading to prototyping and design of commercially viable products. Lectures will cover comparative surveys, operational principles, and integrated design issues associated with mechanical, electrical and control components.

Mechanical Engineering 663 (Medical Science 663)(Kinesiology 663) 3 units; H(3-1/2)

Advanced Muscle Mechanics and Physiology
A look at problems associated within muscle mechanics and contractility. Also the use of muscle mechanics as a scientific discipline to critically learn and evaluate the scientific process. Basic anatomy and physiology of muscle contraction including the cross-bridge theory, and the force-length, force-velocity and force-time relationships of actively and passively contracting muscles will also be covered.

Prerequisite(s): Consent of the Faculty.

Mechanical Engineering 665 3 units; H(3-0)

Elements of Materials Engineering
The course covers a variety of material aspects and provides a fundamental understanding of Materials Science and Engineering. The course emphasizes the understanding of advanced dislocation theory and its application in illustration of diffusion, deformation and fracture of metals. Fundamentals of material strengthening mechanisms are covered. Practical aspects that are relevant to material uses and failures, such as environmental-induced cracking, creep, fatigue, strain aging and corrosion, are discussed. Typical surface analysis techniques for material characterization are introduced.

Mechanical Engineering 667 3 units; H(3-0)

Fracture Mechanics
Basic fracture theory, failure criteria, overview of fracture mechanics, brittle and ductile failure, crack tip parameters, geometric considerations, methods of analysis, fracture toughness and testing standards. Applications in design, fatigue subcritical crack growth, creep and impact.

Mechanical Engineering 669 3 units; H(3-0)

Fatigue of Materials
History and origin of fatigue. Stress life, strain life and fracture mechanics approaches. Low and high cycle fatigue. Low and high temperature fatigue. Combined stresses, initiation, and propagation of cracks. Environmental and statistical effects. Testing techniques and variables. Design and specific material behaviour. Mechanisms of fatigue.

Mechanical Engineering 683 3 units; H(3-0)

Applications of 3D Rigid Body Mechanics in Biomechanics
Applications of 3D motion analysis and rigid body mechanics to musculoskeletal system locomotion, and movement. Experimental, theoretical and numerical methods for optical motion imaging, 3D analysis of joint kinematics and kinetics, joint angle representations, prediction of joint forces, data analysis and filtering, error propagation, inverse and forward dynamics approaches, and applications to clinical and orthopaedic engineering.

Mechanical Engineering 685 (Medical Science 685) 3 units; H(3-3)

Biomechanics of Human Movement
Introduction to the measuring methods (accelerometry, goniometry, film and film analysis, video systems) of biomechanical analysis of human movement (force and force distribution). Description of the mechanical properties of bone, tendon, ligaments, cartilage, muscles and soft tissues. The relation between structure and function of biomaterials. Introduction to descriptive analysis of human movement.

Prerequisite(s): Consent of the Faculty.

Antirequisite(s): Credit for Mechanical Engineering 685 and either Medical Science 685 and Kinesiology 685 will not be allowed.

Mechanical Engineering 698 6 units; F(0-4)

Graduate Project
Individual project in the student's area of specialization under the guidance of the student's supervisor. A written proposal, one or more written progress reports, and a final written report are required. An oral presentation is required upon completion of the course. Open only to students in the MEng (courses only) program.

Mechanical Engineering 713 3 units; H(3S-0)

Research Seminar II
Reports on studies of the literature or of current research. This course is compulsory for all PhD students and must be completed before the candidacy examination.

NOT INCLUDED IN GPA

Medical Physics MDPH

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Note: For listings of related courses, see Astronomy, Astrophysics, Physics, and Space Physics.

Graduate Courses

Medical Physics 623 3 units; H(3-0)

Radiological Physics and Radiation Dosimetry
Photon and electron interactions, charged particle and radiation equilibrium, cavity theory, absolute and relative dosimetry, calibration protocols.

Prerequisite(s): Consent of the Department.

Medical Physics 625 3 units; H(3-0)

Radiation Oncology Physics
Clinical photon and electron beams, brachytherapy, treatment planning, radiation therapy devices, special techniques.

Prerequisite(s): Medical Physics 623 and consent of the Department.

Medical Physics 632 1.5 units; Q(0-1.5)

Clinical Rotation in Radiation Oncology Physics
Clinical observation of radiotherapy for cancer. Students observe the treatment process, including immobilization, CT simulation and radiotherapy treatment. Treatments observed include conventional radiotherapy, intensity modulated radiotherapy, total body irradiation, stereotactic radiosurgery, brachytherapy.

Prerequisite(s): Medical Physics 623 and consent of the Department.

Medical Physics 633 **3 units; H(1-3)**

Radiation Oncology Physics Laboratory
Absorption dose determination, dose descriptors, photon beam modelling, quality control.

Prerequisite(s): Medical Physics 623 and consent of the Department.

Medical Physics 637 **3 units; H(3-0)**

Anatomy and Statistics for Medical Physicists
Anatomy, physiology, probability, statistical inference, hypothesis testing, regression models, clinical trials, survival analysis.

Prerequisite(s): Consent of the Department.

Medical Physics 638 **3 units; H(3-0)**

Imaging for Radiation Oncology Physics
An overview of the imaging modalities used for Radiation Oncology including: CT, MRI, planar X-ray, nuclear medicine and ultrasound. Course will cover basic physics, instrumentation and application.

Prerequisite(s): Consent of the Department.

Medical Physics 639 **3 units; H(3-0)**

Radiobiology and Radiation Safety for Medical Physicists
Cell kinetics, cell survival curves, radiation pathology, fractionation, radiation safety, shielding calculations.

Prerequisite(s): Consent of the Department.

Medical Physics 711 **3 units; H(0-8)**

Clinical Competency I
This three credit hour course extends over the first year of the diploma program and consists of rotations through areas of clinical physics under the supervision of adjunct faculty. Objectives are set, in conjunction with the student, at the commencement of the three rotations comprising this course. Student performance is evaluated by the course mentors at the conclusion of each rotation and by a final oral examination.

Prerequisite(s): Consent of the Department

Medical Physics 712 **3 units; H(0-8)**

Clinical Competency II
This three credit hour course extends over the second year of the diploma program and consists of rotations through more complex areas of clinical physics under the supervision of adjunct faculty. Objectives are set, in conjunction with the student, at the commencement of the three rotations comprising this course. Student performance is evaluated by the course mentors at the conclusion of each rotation and by a final oral examination.

Prerequisite(s): Medical Physics 711 and consent of the Department.

Medical Physics 721 **3 units; H(0-8)**

Clinical Projects I
Two to three clinical projects are completed during this three credit hour course extending over the first year of the program. Projects have clearly defined objectives established by mutual agreement between the student and project supervisor. The project culminates in a written report. Student performance is evaluated against the objectives established at the commencement of the project.

Prerequisite(s): Consent of the Department.

Medical Physics 722 **3 units; H(0-8)**

Clinical Projects II
Two to three clinical projects are completed during this three credit hour course extending over the second year of the program. Projects have clearly defined objectives established by mutual agreement between the student and project supervisor. The project culminates in a written report. Student performance is evaluated against the objectives established at the commencement of the project.

Prerequisite(s): Medical Physics 721 and consent of the Department.

Medical Physics 731 **3 units; H(2T-0)**

Radiation Oncology Physics Tutorials
This three credit hour course requires the student to prepare written answers to 120 pre-set questions published by the Canadian College of Physicists in Medicine as part of the certification process in Radiation Oncology Physics. The course is conducted in a tutorial setting and the students are evaluated on the basis of their answers to a subset of the questions.

Prerequisite(s): Consent of the Department.

Medical Physics 741 **3 units; H(0-4)**

Treatment Planning
This three credit hour course has three components and will be spread over the two years of the program to ensure that the student's increasing knowledge can be consolidated into a thorough understanding of radiation oncology physics. The first component is the observation of simulation and localization under the supervision of a radiation oncologist. The second component is an in-depth study of the physics behind the treatment planning of the main tumour sites. This component utilizes a web-based tool and is led by adjunct faculty. The final component involves following ten patients through the entire radiation therapy process from immobilization through localization, treatment planning, treatment delivery to verification. The students' progress will be evaluated throughout the course with regular feedback to the student.

Prerequisite(s): Consent of the Department.

Medical Science MDSC

Instruction offered by members of the Cumming School of Medicine.

Students contemplating taking any of the undergraduate medical science courses are advised to contact the course co-ordinator(s) through the Undergraduate Sciences program office. Students contemplating taking any of the graduate-level (600 and up) Medical Science courses are advised to contact the course co-ordinator through the Graduate Science Education office.

Junior Courses

Medical Science 203 **3 units; H(3-2T)**

Developing Health Research Literacy I
Students will be introduced to the interdisciplinary scope of health research through reading and writing assignments. Students will learn the basics of academic research enquiry and practice academic writing and presentation skills through individual and team assignments.

Prerequisite(s): Admission to the BHSc Honours program.

Medical Science 205 **3 units; H(3-0)**

Developing Health Research Literacy II
Students will develop their critical thinking skills and their ability to write logically, well-argued research papers. Students will learn the fundamentals of logical reasoning as well as how to analyze theoretical issues in science, medicine, and philosophy.

Prerequisite(s): Medical Science 203 and admission to the BHSc Honours program.

Senior Courses

Medical Science 307 **3 units; H(3-0)**

Science, Philosophy and Society
A survey of underlying ideas concerning the objectives, methods, ambitions and responsibilities of the natural and social sciences.

Prerequisite(s): Second year or higher in the BHSc Honours program or consent of the instructor.

Medical Science 308 **6 units; F(6-0)**

Interdisciplinary Research Approaches
An introduction to the questions, methods and research techniques used across the different majors of Biomedical Sciences, Bioinformatics and Health and Society. Sessions will support the development of a broad perspective on health issues and introduce students to the history and the rules governing the ethical conduct of science and research on humans.

Prerequisite(s): Medical Science 205 and admission to the BHSc Honours program.

Medical Science 321 **3 units; H(3-0)**

Introduction to Immunology
This introductory course is designed to expose students to the study of how the immune system encounters, recognizes, and responds to various infectious and pathogenic conditions. Emphasis will not solely focus on how components of the immune system interact with each other to generate an effective host response but also will be placed on how this immune response may be used to generate new therapies for human disease, how evolving and emerging pathogens interact with, and challenge the immune system, and how our knowledge of immunity has impacted society.

Prerequisite(s): Biology 241 and 243.

Medical Science 341 **3 units; H(3-3T)**

Principles of Human Genetics
Introduction to principles in human genetics including Mendelian and chromosomal basis of inheritance, chromosomal abnormalities, pedigree analysis, mutations, and molecular, metabolic, population and clinical genetics. Studies of model organisms and genomics will be included as required. Incorporates problem-based learning to establish analytical skills in genetics.

Prerequisite(s): Biology 241 and 243 or 231 and enrolment in the BHSc Honours program or consent of the instructor.

Antirequisite(s): Credit for Medical Science 341 and Biology 311 will not be allowed.

Medical Science 351 **3 units; H(3-2T)**

Honours Cellular and Molecular Biology
Introduction to principles in cellular and molecular biology. Emphasizes how structure underlies and determines function in the cell and how complex processes are organized and regulated at the molecular level.

Prerequisite(s): Medical Science 341 and enrolment in the BHSc Honours program, or consent of the instructor.

Corequisite(s): Biochemistry 393.

Antirequisite(s): Credit for Medical Science 351 and Biology 331 will not be allowed.

Medical Science 397 **3 units; H(0-4)**

Independent Studies in Health Sciences
Guided work fostering independent thought, practical research and the completion of written reports for first and second year BHSc students. After consultation with a Departmental faculty member who will supervise the chosen problem, an approval form obtained from the BHSc Office must be signed by the Associate Dean (UHSE) before a student can be registered.

Prerequisite(s): First or second year standing and consent of the BHSc Department.

MAY BE REPEATED FOR CREDIT

Medical Science 401 **3 units; H(3-0)**

Bioinformatics
This introductory course will familiarize students with algorithms and computational techniques for bioinformatics applications. Topics to be covered include algorithm and search engines for the analysis of nucleic acid and protein sequences and structures; machine learning techniques for biological data analysis; systems biology approaches for computational modelling.

Prerequisite(s): 6 units (1.0 full-course equivalent) in Computer Science at the 300 level or Medical Science 341 and 351 or 6 units (1.0 full-course equivalent) in Biological Sciences at the 300 level or consent of the instructor.

Medical Science 402 **6 units; F(3-3)**

Organismal Biology
Organismal structure from the cellular to the organism level focusing on vertebrates with a particular emphasis on humans. Topics covered include cell biology, histology, vertebrate development and anatomy. This course is inquiry-based and will consist of lectures, small group sessions and interactive laboratory sessions.

Prerequisite(s): Enrolment in the BHSc Honours program, Biology 241 and 243, or 231, and Medical Science 351, or consent of the instructor.

Antirequisite(s): Credit for Medical Science 402 and 417 will not be allowed.

Note: Course cannot be taken concurrently with Medical Science 508.

Medical Science 404 **6 units; F(3-3T)**

Integrative Human Physiology
Physiology is defined as the study of how living organisms function and encompasses the integration of processes from molecules to the whole-organism. Provides fundamental principles and concepts about the physiology of the major human organ systems. Each unit is co-ordinated and taught by published scholars.

Prerequisite(s): Enrolment in the BHSc Honours program or consent of the instructor.

Antirequisite(s): Credit for Medical Science 404 and any of Kinesiology 259, 260, 323, Zoology 269, 461 or 463 will not be allowed.

Medical Science 407 **3 units; H(3-2)**

Statistics and Research Design in Health Sciences
An introduction to the study of research design and statistical analysis including a broad overview of the variety of methods for research in health sciences. Students will be introduced to a variety of research tools through lecture and tutorial components.

Prerequisite(s): Enrolment in the BHSc Honours program.

Medical Science 408 **6 units; F(6-0)**

Research Design in Molecular Biology and Bioinformatics
An introduction to the research methods utilized in the Health Sciences. Students will begin to develop the knowledge and skills necessary to conduct research in their respective fields. The importance of research design, qualitative, quantitative and mixed methods and the theoretical constructs that inform these approaches will be emphasized.

Prerequisite(s): Medical Science 308 and admission to the BHSc Honours program.

Medical Science 409 **3 units; H(3-0)**

Brain and Society
Topics will include neuronal mechanisms of addiction, neuronal mechanisms of learning and memory, aging in the human brain and behavioural consequences and mind/brain dichotomy.

Prerequisite(s): Enrolment in the BHSc Honours program.

Medical Science 415 **3 units; H(3-0)**

Introduction to Epidemiology
An introduction to the basic concepts of epidemiology needed to understand and critically analyze research pertaining to health and disease in populations. Methods used in descriptive and analytic epidemiological studies, including the design, analysis and interpretation of results for observational studies and clinical trials will be discussed. Case studies and contemporary events will be used to illustrate epidemiology in action and to highlight the social aspects of applying epidemiology in public health.

Prerequisite(s): Medical Science 308 or consent of the instructor.

Medical Science 417 **3 units; H(3-3)**

Integrated Research Course I
Provides students with the basic conceptual framework, knowledge and skill set to work and think independently in a medical science or life science research environment in their topic area. The course will include lectures in the various topic areas, group sessions and self-directed research project in the topic area.

417.01. Genetics I

417.02. Microbiology, Immunology and Infection I

417.03. Cardiovascular Sciences I

417.04. Cancer Biology I

417.05. Biochemistry and Molecular Biology I

417.06. Pharmacology and Physiology I

417.07. Neuroscience I

417.08. Special Topics I

Prerequisite(s): Medical Science 308 and enrolment in the BHSc Honours program, or consent of the instructor.

Antirequisite(s): Credit for Medical Science 417 and 402 will not be allowed.

Note: Course needs to be taken in combination with the corresponding Medical Science 419 integrated research course II in the same academic year. Course cannot be taken concurrently with Medical Science 508.

Medical Science 419 **3 units; H(0-6)**

Integrated Research Course II
Provides students with the basic conceptual framework, knowledge and skill set to work and think independently in a medical science or life science research environment in their topic area. The course will be a continuation of the courses topic areas, and will for the most part consist of the self-directed laboratory research project started in the topic area in Medical Science 417.

419.01. Genetics II

419.02. Microbiology, Immunology and Infection II

419.03. Cardiovascular Sciences II

419.04. Cancer Biology II

419.05. Biochemistry and Molecular Biology II

419.06. Pharmacology and Physiology II

419.07. Neuroscience II

419.08. Special Topics II

Prerequisite(s): Medical Science 308, the appropriate 417 course and enrolment into to the BHSc Honours program or consent of the instructor.

Antirequisite(s): Credit for Medical Science 419 and 402 will not be allowed.

Note: Course needs to be taken in combination with the corresponding Medical Science 417 Integrated Research Course I in the same academic year.

Medical Science 501 (Biology 501) **3 units; H(3-0)**

Principles and Mechanisms of Pharmacology
Basic principles of pharmacology, with specific emphasis on receptor signaling mechanisms.

Prerequisite(s): Enrolment in the BHSc Honours program, Biochemistry 443, and one of Zoology 461, 463, or Medical Science 404, or consent of the instructor.

Medical Science 503 (Biology 503) **3 units; H(3-0)**

Pharmacology of Organ Systems
Pharmacology of the nervous, cardiovascular, renal and immune systems, as well as anti-cancer therapies. Principles of toxicology.

Prerequisite(s): Medical Science 501 (Biology 501) or consent of the Faculty.

Medical Science 507 **3 units; H(3-3)**

Special Problems in Medical Science
Lectures, seminars, term papers and training in theoretical and/or laboratory methods. After consultation with a faculty member who will supervise the chosen problem, an approval form obtained from the BHSc Office must be signed by the Associate Dean (UHSE) before a student can be registered.

Prerequisite(s): Consent of the BHSc Honours Program.

MAY BE REPEATED FOR CREDIT

Medical Science 508 **12 units; 2xF(0-6)**

Honours Thesis and Research Communication
Capstone research course in the BHSc to be conducted through any one of the basic research departments. Students would be expected to conduct research. Course also involves weekly small group sessions aimed at building research communication skills. Course culminates with submission of a written thesis that is presented and defended in front of a panel of faculty members in an oral examination.

Prerequisite(s): Enrolment in the BHSc Honours program and Health and Society 408 or Medical Science 408 and a minimum cumulative 3.30 GPA or consent of the director.

Note: This course is worth 12 units (2.0 full-course equivalents) and is offered over two sessions. Course cannot be taken concurrently with Medical Science 402, 417 or 419.

Medical Science 509 **3 units; H(3-3)**

Proteomics
An introductory course to familiarize students with techniques used for protein identification and proteome analysis, including one and two-dimensional gel electrophoresis, mass spectrometry and the databases and search engines used in the identification of expressed proteins.

Prerequisite(s): Biochemistry 443 and Medical Sciences 351 or Biology 331.

Medical Science 515 (Biology 515) **3 units; H(3-0)**

Cellular Mechanisms of Disease
The cellular and molecular mechanisms underlying basic human disease processes and how these can be influenced by lifestyle and environmental factors. The ways in which this knowledge can be used in the laboratory diagnosis of disease.

Prerequisite(s): Biochemistry 443 and one of Biology 331 or Medical Science 351.

Medical Science 517 **3 units; H(3-1T)**

Introduction to Biotechnology Business and Profession
An overview of the biotechnology sector from several perspectives: product development, regulatory, intellectual property, market analysis, and finance. This course will include two modules. The first is a series of lectures by faculty and local entrepreneurs to provide the necessary background for the assignments in the second module. The second module will include student-selected case studies and an analysis of a small biotechnology company.

Prerequisite(s): Medical Science 351 or consent of the instructor.

Medical Science 519 **3 units; H(3-0)**

Advanced Bioinformatics
Designed to develop student ability to perform bioinformatics analyses of datasets and develop their knowledge of the current literature. The course will emphasize careful study of recent methodologies for chromatin immunoprecipitation followed by sequencing (ChIP-seq) dataset analysis. The course will include lectures, literature review sessions and a self-directed bioinformatics research project.

Prerequisite(s): Medical Science 401 and at least one of Computer Science 217, 219, 231 or 233; or consent of the instructor.

Medical Science 521 **3 units; H(3-3)**

Human Anatomy
An inquiry-based exploration of clinically significant human anatomy. The course will follow a systems-based approach, and will make use of multiple learning formats. Each week, the instructor will lead classroom and laboratory sessions that explore an anatomical system from developmental, functional, and clinical perspectives.

Prerequisite(s): Fourth year standing in the BHSc program or consent of the instructor.

Medical Science 528 **6 units; F(0-6)**

Independent Studies in Medical Science
Original and independent thought, practical research and the completion of written and oral reports. After consultation with a faculty member who will supervise the chosen problem, an approval form obtained from the BHSc Office must be signed by the Associate Dean (UHSE) before a student can be registered.

Prerequisite(s): Consent of the BHSc Department.

MAY BE REPEATED FOR CREDIT

Medical Science 535 **3 units; H(3-0)**

Psychosocial Oncology
Focuses on developing the understanding in health care practitioners of the central concepts related to caring for cancer patients and their families.

Prerequisite(s): Consent of the instructor.

Antirequisite(s): Credit for Medical Science 535 and 635 will not be allowed.

Medical Science 541 **3 units; H(3-1T)**

Advanced Genetics I
Historical papers will illustrate the foundations of modern genetic principles. Topics including the chromosomal theory of inheritance, the role of pairing and recombination for chromosomal disjunction during meiosis, cytogenetics, the nature of dominant mutations, genetic screens and genetics analysis of developmental pathways. Material covered is drawn from model organisms and humans.

Prerequisite(s): Medical Science 341 or Biology 311 or consent of the instructor.

Medical Science 543 **3 units; H(3-0)**

Advance Genetics II
An advanced course in molecular genetic analysis. Topics will vary from year to year, but may include identification of the structure, transmission, mutation and molecular pathology of human genes, the use of experimental organisms (chick, fish, fly, mouse, worm) to model human genetic diseases, and molecular studies of human populations and evolution. The focus will be upon applied molecular genetics with recurring emphasis on the theme of relevance to issues in health and society.

Prerequisite(s): Medical Science 341 or Biology 311, and Medical Science 402 or consent of the instructor.

Note: Previous completion of Medical Science 541 is suggested but not required.

Medical Science 545 **3 units; H(3-0)**

Genomics
Examine the strategies and techniques, including massively parallel sequencing, used in genomic and genetic studies. Review how model systems and genome editing are used to establish the functional consequences of genomic variation. Students can expect to gain a comprehensive understanding and broad appreciation of the significance of genomic information in context of rare and common human diseases, and genome biology.

Prerequisite(s): Medical Science 408 or Cellular, Molecular and Microbial Biology 413 or consent of the instructor.

Medical Science 561 (Cellular, Molecular and Microbial Biology 561) **3 units; H(3-0)**

Cancer Biology
Advances in methodology and in theoretical concepts have permitted continuing breakthroughs in our understanding of the organismal, cellular and molecular biology of cancer cells, and in the development of novel strategies for cancer prevention, diagnosis and treatment. These advances will be presented in a comprehensive overview of cancer including issues of demographics and incidence, causation and detection, origins and progression and therapeutic approaches. Emphasis will be placed on the cell and molecular biology of cancer and on the interaction of the cancer cell with the host organism.

Prerequisite(s): Biochemistry 443, Medical Science 351 or Biology 331, and Cellular, Molecular and Microbial Biology 411.

Medical Science 565 (Cellular, Molecular and Microbial Biology 565) **3 units; H(3-0)**

Advanced Topics in Pathogenic Microbiology
Provides a fuller understanding of bacterial diseases using a systems approach and illustrating key paradigms via the consideration of specific pathogens. Topics include: strategies for bacteria surviving host immune responses, bacterial invasion strategies, opportunistic infections, disease Pathogenesis, and antibiotic resistance, challenges of dealing with emerging infections. Lectures, small group interactive sessions, specified readings.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343 and 431.

Medical Science 567 (Cellular, Molecular and Microbial Biology 567) **3 units; H(3-0)**

Advanced Topics In Immunology
New and emerging themes in immunology, with an emphasis on disease processes such as inflammation in the gut, kidney and lung. Topics include: innate immunity, the inflammasome, sterile inflammation, process and mechanism of immune cell recruitment in different tissues, T cell biology, B cell biology, regulatory immune cells, mucosal immunity, airways responses to virus, mechanisms of food allergies, inflammatory bowel disease. Lectures, small group interactive sessions, specified readings.

Prerequisite(s): Cellular, Molecular and Microbial Biology 527 or Medical Science 321.

Medical Science 569 **3 units; H(3-1T)**

Advanced Topics in Physiology
Designed for undergraduates with a general understanding of human physiology who wish to pursue advanced topics in a physiological system(s). The physiological system offered will vary from year to year and students should contact the instructor for more information prior to enrolling in the course. There will be a review and then build on basic physiological principles through a series of lectures and/or discussion groups. An examination of the specified area of physiology in depth by introducing students to research methodologies and pathological processes.

Prerequisite(s): Medical Science 404 or Zoology 463 or consent of the instructor.

Graduate Courses

Medical Science 603 (Biology 603) **3 units; H(3-1)**

Biology of Laboratory Animals
Based on the Canadian Council of Animal Care Syllabus "Basic Principles of Laboratory Animal Science for Research Scientists." In addition to the study of common, research, farm and exotic animals, topics covered include ethical considerations, regulation and legislation, animal models, animal facilities and husbandry, hazard control, surgery, anaesthesiology, euthanasia and post-mortem examinations. Practical sessions will provide experience in handling and restraint of specific laboratory animals, injections, blood collection, anaesthesiology and surgery.

Prerequisite(s): Consent of the Faculty.

Note: Enrolment in this course is restricted to graduate students who will do research utilizing animals.

Medical Science 604 **6 units; F(3-3)**

Integrative Human Physiology
Physiology is the study of how living organisms function and encompasses the integration of processes from molecules to the whole-organism. Designed to provide the student with fundamental

principles and concepts about the normal function of the major human organ systems. At the end of this course, the student should be well equipped to apply their acquired knowledge to solve complex physiological problems related to integrative human physiology.

Prerequisite(s): Consent of the Faculty.

Medical Science 605 3 units; H(3-0)
(Computer Science 605)

Information Storage and Processing in Biological Systems
Examination of complex biological systems; concepts and fundamentals of biological solutions to information storage and processing: modelling and computer simulation of biological systems; information storage in biological molecules; genetic networks; hierarchical organization of biological information processing in signal transduction, development, evolution, and ecology; biological control systems.

Prerequisite(s): Consent of the Faculty.

Medical Science 609 3 units; H(3-0)

Gene Expression
The flow of genetic information from DNA to final protein product. The subject will be covered in two courses offered in alternating years: gene structure and regulation of transcription, including gene structure and organization, chromatin structure, regulation of transcription and post-translational processing; and the activity of genes during development including stored messenger ribonucleoprotein particles and translational control in gametes, the switch from maternal to zygote genome control of development in early embryos and the molecular basis of morphogenesis and differentiation.

609.02. Genes and Development

Prerequisite(s): Medical Science 537 (Biochemistry 537) or equivalent and consent of the Faculty.

Antirequisite(s): Credit for Medical Science 609.01 and 607.01 will not be allowed. Credit for Medical Science 609.02 and 751.14 will not be allowed.

Medical Science 611 3 units; H(3-0)
(formerly Medical Science 612)

Medical Microbiology
The basic principles of medical microbiology and the pathogenesis of infectious disease and of clinically important microbial pathogens including bacteria, viruses, parasites and fungi. Recent concepts will be described and students will be expected to present and critically discuss research advances of their choosing from the current research literature.

Prerequisite(s): Cellular, Molecular and Microbial Biology 241 and 343 or equivalent or consent of the Faculty.

Medical Science 613 3 units; H(3-0)

Advanced Studies in Microbiology
Specialized topics including basic principles of infection; spread, prevention and control of infectious diseases; mechanisms of and approaches to study bacterial pathogenesis; mechanism, methodology and modelling of gene expression.

613.01. Epidemiology of Infectious Diseases

613.02. Pathogenesis of Microbial Disease

613.05. Regulation of Gene Expression in Bacteria

Prerequisite(s): Medical Science 612 or Cellular, Molecular and Microbial Biology 421 or 521 or consent of the Faculty.

Medical Science 619 3 units; H(4-2)

Neurosciences
Introductory neuroscience courses covering aspects of cellular, molecular, and systems physiology, neuroanatomy, and neurodevelopment.

619.01. Cellular, Molecular and Developmental Neuroscience

619.02. Systems Neuroscience and Neuropathology

Prerequisite(s): Must be registered in the Neuroscience Graduate Program. Consent of instructor(s) is required for all other students.

Note: Not open to undergraduate students.

Medical Science 620 3 units; H(3-0)

Topics in Systems Physiology
Designed for students undertaking research in physiology or related disciplines with only limited prior exposure to the discipline. Introduces and discusses fundamental and current issues in physiology ranging from the basic physiological systems through to translational clinical topics. Encompasses the basic physiological mechanisms with emphasis on the role of the autonomic nervous system. Subject areas will include basic physiology of the cardiovascular, respiratory, gastrointestinal, renal, endocrine and reproductive systems.

Prerequisite(s): Consent of the Faculty.

Medical Science 621 3 units; H(3-0)

Principles of Drug Action
The action of chemicals and drugs on biological systems ranging from subcellular particles to the intact organism.

621.01. Basic Principles of Pharmacology

Prerequisite(s): Zoology 461, Medical Science 404 and Medical Science/Biology 501, or consent of the Faculty.

Medical Science 622 3 units; H(3S-0)

Neurobiology of Mental Illness
Students are exposed to up-to-date research regarding the neurobiological theories of various mental illnesses (such as depression, anxiety disorders, schizophrenia, etc.). The seminar format will involve discussion in both research and review articles. The focus of discussion will be on both preclinical research and clinical studies that shed insight into the neurobiology of mental illnesses or their treatments.

Prerequisite(s): Medical Science 619.02 and registration in a Cumming School of Medicine graduate program. Consent of instructor is required for all other students.

Note: Open to Psychology graduate students and Psychiatry residents with consent of instructor.

Medical Science 623 3 units; H(3-1T)

Respiratory Science and Critical Illness
Respiratory physiology;including topics such as cellular, morphology, mechanics, control of breathing, and respiratory muscles, necessary to an understanding of respiration and respiratory failure. As well, core physiology and molecular biology underlying critical illness.

623.01. Pulmonary Mechanics and Gas Exchange

623.02. Physiology of Respiration and Critical Illness

623.03. Respiratory Science: Basic

623.04. Respiratory Science: Applied

Prerequisite(s): Zoology 463 or 465 or consent of the Faculty.

Medical Science 624 3 units; H(2-2)
(formerly Medical Science 751.42)

Neuroanatomy
Detailed introduction to neuroanatomy using Homo sapiens as the primary experimental species but relying on other vertebrates for additional details. Detailed anatomic aspects of each major brain region, along with major connections and functions related to those regions will be presented. Laboratories will examine gross specimens, virtual microscopic images, and other anatomic images.

Prerequisite(s): Medical Science 619.02 or consent of the instructor.

Medical Science 629 3 units; H(3-0)

Cardiovascular Dynamics
Includes topics such as basic physiologic mechanisms including excitation-contraction coupling, mechanics, energetics, and cardiovascular control; major diseases entities as a means of illustrating pathologic alterations in normal physiologic mechanisms; or a systematic in-depth examination of the chemicals that affect the cardiovascular system.

629.01. Cardiovascular Physiology

629.02. Cardiovascular Pathophysiology

629.03. Cardiovascular Pharmacology

Prerequisite(s): Consent of the Faculty.

Medical Science 631 3 units; H(3-0)

Muscle Physiology
Contractile processes, excitation-contraction coupling, the control of contraction and energetics in smooth, cardiac and skeletal muscle. Molecular studies of the contractile process and of the process of excitation contraction coupling.

Prerequisite(s): Consent of the Faculty.

Medical Science 633 3 units; H(3-0)

The Kidney
Advanced courses detailing the functional organization of the kidney at all levels, from cell to intact organism. Topics encompass basic physiological principles and their relevance to experimental medicine and therapeutics, as well as the study of disease processes, which impact kidney function.

633.01. Renal Physiology

633.02. Renal Pathophysiology

633.03 History of Renal Physiology

Prerequisite(s): Medical Science 604 or equivalent or consent of the Faculty.

Medical Science 635 3 units; H(3-0)

Psychosocial Oncology
A seminar-based course focusing on the possible causes of psychosocial problems in cancer patients and families (medical, psychological and social) and also on how patients and families are helped through the difficult transitions resulting from a cancer diagnosis, treatment, recurrent disease, and end of life care.

Prerequisite(s): Consent of the Faculty.

Antirequisite(s): Credit for Medical Science 635 and 535 will not be allowed.

Note: This course is open to health professionals and researchers, and to advanced undergraduate students in relevant disciplines.

Medical Science 636 **3 units; H(3-1T)**

Advanced Topics in Physiology
Provides a general understanding in physiological systems and will present advanced topics in specified physiological system(s) for further depth of understanding. Review and build on basic physiological principles through a series of lectures and discussion groups and will examine a specified area of physiology in-depth by introducing students to research methodology and pathological processes in the system.

Prerequisite(s): Medical Science 404 or Zoology 463 or consent of the instructor.

Antirequisite(s): Credit for Medical Science 569 and Medical Science 636 will not be allowed.

Medical Science 637 **3 units; H(3-0)**

Gastrointestinal Physiology
Physiology of the gastrointestinal (GI) tract at all levels from the cell to the intact system. Medical Science 637.01 has three components: 1) An introductory series of lectures covering the basic physiological principles of the regulation of the GI tract and the individual organs that comprise it or are associated with it; 2) Extended directed tutorials conducted online through D2L. Topics will be selected to reflect the needs and interests of the enrolled students; 3) A written term paper on a subject of the students' own choice and pre-approved by the course co-ordinator that will also be presented orally to the class.

637.01. Organization and Function of the GI Tract

Prerequisite(s): Consent of the Faculty.

Medical Science 638 **3 units; H(4-0)**

Mucosal Pathophysiology
Focuses on the physiology and pathophysiology of the gastrointestinal tract, lung and other mucosal tissues. A particular emphasis will be placed on inflammatory processes in these tissues, and how they contribute to symptom generation and tissue dysfunction. Involves independent research on the part of the students, small group sessions, written assignments and class presentations

Prerequisite(s): Consent of the Faculty.

Medical Science 639 **3 units; H(3-0)**

Immunology
Introductory and advanced courses in immunology that cover humoral and cellular immunity and the inflammatory response at the cellular, molecular, and whole organism level. Basic mechanisms that lead to immunity or to inflammatory responses. The contribution of immunological and inflammatory processes in the immunopathogenesis of disease.

639.02. Cellular and Molecular Immunology

639.04. Inflammation

Prerequisite(s): Consent of the Faculty.

Medical Science 640 **3 units; H(3-1T)**

Introduction to Immunology
Introductory immunology for graduate students who have no background in immunology in their undergraduate studies. It provides a comprehensive overview of the immune responses: antibody-antigen interaction, antibody structure, genetics and synthesis, cellular immunology, MHC, phagocytosis, and tolerance. Using this basic understanding of fundamental immune processes the involvement of the immune response in autoimmunity, hypersensitivity, tissue rejection, tumor immunology, vaccine production, viral, bacterial, fungal and parasitic infections will be discussed. Additionally, methods for the study of immunology will be covered.

Prerequisite(s): Consent of the Faculty.

Antirequisite(s): Credit for Medical Science 640 and Cellular, Molecular and Microbial Biology 527 will not be allowed.

Note: This course will share lectures with Cellular, Molecular and Microbial Biology 527 with an additional separate tutorial.

Medical Science 641 **3 units; H(3-0)**

Genetics
Advanced courses that provide in-depth coverage of the research discipline of genetics, including the areas of cytogenetics, genomics, metabolic genetics, mouse genetics, population genetics, and human and medical genetics.

641.01. Advanced Genetics I

641.02. Advanced Human Cytogenetics

641.03. Advanced Genetics II

641.04. Genomics

Prerequisite(s): Consent of the instructor.

Medical Science 663 **3 units; H(3-1/2)**
(Kinesiology 663) (Mechanical Engineering 663)

Advanced Muscle Mechanics and Physiology
A look at problems associated within muscle mechanics and contractility. Also the use of muscle mechanics as a scientific discipline to critically learn and evaluate the scientific process. Basic anatomy and physiology of muscle contraction including the cross-bridge theory, and the force-length, force-velocity and force-time relationships of actively and passively contracting muscles will also be covered.

Prerequisite(s): Consent of the Faculty.

Medical Science 668 **3 units; H(3-3)**

Biotechnology Commercialization
Technology commercialization is the process of translating research results, scientific discoveries or processes and methods into a commercially useful and profitable product. Students will study the biotechnology commercialization process and will develop a mock-up i) starting with a new product or service idea, ii) carrying out the early stage development, iii) developing the necessary strategic and business plans, iv) securing adequate and appropriate financing, and v) marketing and selling the product. The primary deliverable will be the creation of a strategic plan for an innovative biotechnology product or service.

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program. Consent of instructor(s) is required for all other students.

Medical Science 669 **3 units; H(3S-3T)**

Clinical Trials and Bio-manufacturing
The objective of this course is to provide general understanding and appreciation, regulatory requirements and ethical considerations around conducting clinical trials as well as bio-pharmaceutical manufacturing. An emphasis will be placed on regulatory obligations. The course will provide opportunities in writing protocols, clinical trial applications, auditing facilities and process validation.

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program. Consent of instructor(s) is required for all other students.

Medical Science 670 **6 units; F(0-6)**

Practicum in Biomedical Technology
A six unit (full) course carried out in an academic or industrial setting for a period of at least twelve weeks. Students have an opportunity to apply the principles and methods of investigation learned during the Master of Biomedical Technology program and carry out related research. Practicum projects can be focused on any of the following aspects of the commercialization process: patent filing, research and development, business development, manufacturing to clinical trials, marketing and sales.

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program.

Note: Completion of all other course requirements in Master of Biomedical Technology program is normally required prior to registration for this course. Exceptions must be approved by the Graduate Director.

NOT INCLUDED IN GPA

Medical Science 671 **3 units; H(0-6)**

Techniques in Medical Science
Introduction to the theory of operation of electronic devices commonly used in biophysical studies including principles of amplifiers and filters, micro- and patch electrode techniques and computer-laboratory interfacing.

Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Medical Science 672 **3 units; H(2-0)**

Biotechnology Business Aspects
Aspects involved in taking an original scientific idea or discovery all the way to a start-up company will be covered. Lecturers discuss commercialization, venture capital, business plan, patents and law, marketing.

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program. Consent of instructor(s) is required for all other students.

Medical Science 673 **3 units; H(3S-0)**

Careers in Biotechnology
A series of talks and workshops designed to provide students with practical knowledge of the biotechnology industry. In collaboration with the University of Calgary Career Services, the course covers personal and professional development planning, resume writing, networking, negotiation and interviewing skills and job search strategies specifically for the biotechnology field. This course runs during the fall and winter block weeks with additional retreat days throughout the year.

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program. Consent of instructor(s) is required for all other students.

Note: Admission to the Master of Biomedical Technology program is normally required for enrolment in this course.

NOT INCLUDED IN GPA

Medical Science 674 **6 units; F(3-0)**

Integrated Systems Course
The principles of molecular and cell biology, pathology, physiology, pharmacology, microbiology and immunology as applied to new diagnostics, vaccines or therapeutics. Lectures in the two courses are in parallel and fully integrated. Both courses are required components of the MBT program. The goal of the course, with an emphasis on cellular and molecular mechanisms in health and disease, is to provide students with the skills to interface with individuals in these disciplines in the biotechnology industry. Complemented by special lectures that provide industry perspectives in these disciplines.

674.01. Physiological and Pharmacological Aspects of Therapeutics Development

674.02. Molecular Cell Biology of Diagnostic and Vaccine Development

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program. Consent of instructor(s) is required for all other students.

Medical Science 675 **3 units; H(2-3T)**

Bioinformatics Resources for the Biologist
This introductory graduate level course will familiarize biologists with algorithms and search engines used to analyze nucleic acid and protein sequences and structures.

Prerequisite(s): Consent of the Faculty.

Medical Science 676 **3 units; H(2.5-1)**

Scripting and Database Querying for Molecular Biologists
Intended for biologists who wish to improve their bioinformatics analysis capabilities by learning just a small amount of query and programming syntax. The focus is on practicality rather than programming theory. The course explores how to use existing tools (on the command-line and on the Web) to gather and process large datasets all at once, rather than doing many individual analyses manually.

Note: No prior programming experience is required.

Medical Science 677 **3 units; H(1-6)**

Directed Study in Biomedical Technology
Lectures, seminars, term papers or training in theoretical and/or laboratory methods at the advanced level in biomedical technology or medical sciences.

Prerequisite(s): Consent of both the faculty member who will supervise and the MBT faculty member who will co-supervise the chosen study and must be registered in the Master of Biomedical Technology program.

MAY BE REPEATED FOR CREDIT

Medical Science 678 **3 units; H(1-3T-6)**

Project in Biomedical Technology
Students will conduct both business and laboratory-based projects throughout the year. The business-based aspect will include running a business, doing market research for companies or working with their business mentor. The laboratory-based aspect will include new diagnostics development and validation. This course will cover basic principles of project management as well as biotech lab theory and practical aspects covered via tutorials, journal club and laboratory sessions. There will be a combination of monthly meetings, lectures, lab tutorials, commercial technology reviews, tours, demos, and practical labs.

Prerequisite(s): Must be registered in the Biomedical Technology Graduate Program. Consent of instructor(s) is required for all other students.

Medical Science 679 **3 units; H(2-2)**

Fundamentals of Bioinformatics
Foundational techniques and current research in bioinformatics are explored. Topics covered will include large-scale programmatic data access via data-marts and genome browsers, visualization, statistical techniques, and analysis of sequence and 'omics datasets.

Prerequisite(s): Registration in the Bioinformatics specialization of the Biochemistry and Molecular Biology graduate program or consent of the instructor.

Note: This course assumes some computational background including programming or scripting ability.

Medical Science 683 **3 units; H(3-0)**

The Biology and Therapy of Human Cancer
An examination and discussion of current knowledge of the molecular and cellular biology of human cancer and the scientific basis of cancer therapy. Offered in a modular format: each course will consist of one required module and two elective modules. Students can choose the elective modules from a list that is specific for each course. Modules will emphasize student presentations, critical evaluation, and discussions of current and seminal research papers on the module topic. Refer to the Southern Alberta Cancer Research Institute website at sacri.ucalgary.ca for more information.

683.01. Cancer Pathology, Epidemiology and Therapy

683.02. Molecular Mechanisms of Cancer

683.04. Cell Biology of Cancer

Prerequisite(s): Must be a Cumming School of Medicine graduate student. All other students require consent of the instructor.

Medical Science 685 **3 units; H(3-3)**
(Mechanical Engineering 685)

Biomechanics of Human Movement
Introduction to the measuring methods (accelerometry, goniometry, film and film analysis, video systems) of biomechanical analysis of human movement (force and force distribution). Description of the mechanical properties of bone, tendon, ligaments, cartilage, muscles, and soft tissues. The relation between structure and function of biomaterials. Introduction in descriptive analysis of human movement.

Prerequisite(s): Consent of the Faculty.

Antirequisite(s): Credit for more than one of Medical Science 685, Mechanical Engineering 685 and Kinesiology 685 is not allowed.

Medical Science 689 **3 units; H(3-0)**

Medical Imaging
Introduction to the theory and practical applications of medical imaging. Specific courses focus on an overview of modern diagnostic imaging techniques (689.01), as well as advanced study of specific techniques including magnetic resonance imaging (689.02) and medical image processing (689.03), and molecular imaging (689.04).

689.01. Medical Imaging Techniques

689.02. Advanced Magnetic Resonance Imaging

689.03. Advanced Medical Image Processing

689.04. Advanced Molecular Imaging

689.10. Medical Imaging Theory

689.11. Medical Imaging Applications

689.99. Medical Imaging Project

Prerequisite(s): Consent of the Faculty.

Note: Medical Science 689.01 is the core course and should be taken prior to taking any of the advanced Medical Science 689 courses. Courses are open to students registered in the Medical Imaging specialization, other interested graduate students in the fields of medicine, engineering, and science and to appropriately prepared undergraduate students enrolled in computer engineering, electrical engineering, and physics.

Medical Science 701 **3 units; H(3-0)**
(Veterinary Medicine 701)

Advanced Topics in Reproductive Health
A series of topics, ranging from basic sciences to clinical topics (including ethical issues) to increase awareness and comprehension regarding current issues in reproductive health.

Prerequisite(s): Consent of course co-ordinator and student's supervisor, if applicable.

Note: Interest in reproductive health/reproductive biology is essential.

Medical Science 703 **3 units; H(2-6)**

Human Anatomy: Concepts, Exploration and Teaching
Introductory course for graduate students with an interest in mammalian morphology to human cadaver dissection, human anatomy concepts and teaching strategies within the medical professional curriculum. Weekly lectures and discussions supplement a cadaver dissection-based course intended for students interested in pursuing an academic career in a medically related field.

Prerequisite(s): Should have some previous experience with dissection. Consent of the instructors.

Medical Science 706 **3 units; H(3-0)**

Theory and Practice of Family Therapy
Overview of different family therapy approaches focusing on systemic assessment and systemic intervention through therapeutic interviewing. The development of student knowledge and skills in family therapy utilizing social constructionist, narrative, systemic, collaborative, and pro-feminist ideas while fostering the professional identity of the therapist.

706.01 Theory and Practice of Family Therapy I: Systemic Approaches

706.02 Theory and Practice of Family Therapy II: Postmodern Approaches

Prerequisite(s): Must be registered in the Cumming School of Medicine graduate programs. All others will require consent of the instructor.

Medical Science 707 **3 units; H(2S-12)**

Family Therapy Practicum
The development of conceptual and experiential expertise in working therapeutically with families.

707.01. Family Therapy I

707.02. Family Therapy II

Prerequisite(s): Consent of the Faculty.

NOT INCLUDED IN GPA

Medical Science 708 **3 units; H(3-0)**

Theory and Practice of Interprofessional Psychosocial Oncology

Provides graduate students with a multidisciplinary introduction to the field of psychosocial oncology. Emphasis will be placed on understanding and interpreting the experience of cancer informed by theory, evidence and illness narratives. Case-based learning in small interprofessional groups will allow students to explore a variety of key learning themes relevant to psychosocial oncology including distress assessment, depression, anxiety, adjustment and coping, sexuality, loss and grief. Attention to diversity will be integrated throughout the course.

Prerequisite(s): Consent of the instructor.

Note: Must have an undergraduate degree in a relevant domain (including, but not limited to medicine, psychology, nursing, social work, spiritual care/theology). This is an online course.

Medical Science 710 **3 units; H(3-0)**

Business and Careers in Biotechnology

An overview of the biotechnology sector from several perspectives: product development, regulatory, intellectual property, market analysis and finance. This course will include series of lectures and discussions to provide both the necessary background about the biotechnology industry and an understanding of careers in the biotechnology industry.

Prerequisite(s): Must be a registered graduate student in a thesis-based Masters or Doctoral program.

Medical Science 713 **3 units; H(0-3T)**

Topics in Mountain Medicine and High Altitude Physiology

A tutorial-based course focused on high altitude medicine and physiology. The aim of the course is to introduce the students to the physiological adaptations of, and pathophysiology associated with, the hypoxia of altitude. Students will be introduced to several diseases associated with the hypoxia of high altitude (i.e., Acute Mountain Sickness; High Altitude Pulmonary Edema, High Altitude Cerebral Edema), and the pathophysiology underlying these diseases.

Prerequisite(s): Consent of the instructor.

Medical Science 721 **3 units; H(3-0)**

Biochemistry and Molecular Biology

Discussions and presentations in a small group format will highlight historical and recent developments in analysis of eukaryotic genomes and control of gene expression, chromosome structure, translation, protein structure, proteomics, regulatory networks and related technologies and their applications to the study of human diseases. Additional learning objectives relate to the critical assessment of published literature as well as the development of research proposal writing and presentation skills.

Prerequisite(s): Must be registered in the Biochemistry and Molecular Biology Graduate Program. Consent of the instructor is required for all other students.

Medical Science 722 **3 units; H(4-0)**

The Blood Vessel

Modular course offering advanced knowledge at the cellular, molecular, and whole organism levels including the hormonal regulation of the vascular system, the interaction between endothelium and smooth muscle in the blood vessel, the molecular mechanisms underlying smooth muscle contraction and relaxation, differentiation and dedifferentiation, and the pathogenesis of vascular diseases including hypertension and atherosclerosis. Drug treatments for vascular diseases and their molecular mechanisms will also be covered.

722.01. Vascular Biology

722.02. Vascular Pharmacology

Prerequisite(s): Open to graduate students registered in the Cumming School of Medicine graduate programs. All other students require consent of instructor.

Antirequisite(s): Credit for Medical Science 722.01 and 722.02 will not be allowed.

Medical Science 740 **6 units; F(3T-0)**

Smooth Muscle Structure Function

An inquiry-based approach used to provide students with a broad background for the study of smooth muscle and to introduce students to current trends in the field. Students will also be introduced to the spectrum of research on smooth muscle ongoing at the University of Calgary. The subjects to be included range from the molecular biology and biochemistry of individual proteins to the function and regulation of integrated smooth muscle systems. A number of methodological approaches that are being used for the study of smooth muscle will also be discussed.

Prerequisite(s): Consent of the instructor.

Medical Science 744 **6 units; F(3-0)**

Human Pathology

The principles of basic pathology, including cellular responses to injury, inflammation, tissue reaction, hemodynamic, basic genetics, and neoplasia are taught through a series of interactive lectures and seminars which are applied to examine the human system and the diseases that affect it.

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program or the Pathologists' Assistant specialization of the Medical Science graduate program. Consent of instructor is required for all other students.

Medical Science 745 **3 units; H(3-0)**

Human Histology

Normal histology of the human body and how it relates to the pathologic mechanisms of function and disease will be discussed and presented in small group format.

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program or the Pathologists' Assistant specialization of the Medical Science graduate program. Consent of instructor is required for all other students.

Medical Science 746 **3 units; H(3-0)**

Integrated Pathologists' Assistant Skills

A series of discussions and workshops to solidify the knowledge gained throughout the Pathologists' Assistant Master's program that will provide practical knowledge of the Pathologists' Assistant profession, in particular focusing on laboratory management skills, quality control and quality assurance, and the legal and accreditation requirements for medical laboratories.

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program. Consent of instructor is required for all other students.

Medical Science 747 **3 units; H(0-3)**

Pediatric Pathology Practicum

Practical training in the technical skills of grossing a surgical specimen from the pediatric population in a safe and appropriate manner, as well as grossing placentas and performing fetal autopsies. Skill development will include quality management, ancillary techniques, and medical photography.

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program or the Pathologists' Assistant specialization of the Medical Science graduate program. Consent of instructor is required for all other students.

Medical Science 748 **3 units; H(0-3)**

Surgical Pathology Practicum

Practical training in the technical skills of grossing a surgical specimen in a safe and appropriate manner, as well as grossing placentas and performing fetal autopsies. Skill development will include quality management, ancillary techniques, frozen section cutting, and medical photography.

748.01. Surgical Pathology Practicum I

748.02. Surgical Pathology Practicum II

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program or the Pathologists' Assistant specialization of the Medical Science graduate program. Consent of instructor is required for all other students.

Note: Students are required to take both Medical Science 748.01 and Medical Science 748.02.

Medical Science 749 **3 units; H(0-3)**

Autopsy Pathology Practicum

Hands on rotation that will train students how to perform autopsies under the supervision of a pathologist. Knowledge from anatomy, physiology, histology, and human pathology will be incorporated in the training.

749.01. Autopsy Pathology Practicum 1

749.02. Autopsy Pathology Practicum 2

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program or the Pathologists' Assistant specialization of the Medical Science graduate program. Consent of instructor is required for all other students.

Note: Students are required to take both Medical Science 749.01 and Medical Science 749.02.

Medical Science 750 **3 units; H(0-4)**

Pathologists' Assistant Research Project

Guided work with practical research, encouraging independent thought and collaboration with pathologists and clinical colleagues. Requires completion of written reports and oral presentation on research performed.

750.01. Pathologists' Assistant Research Project I

750.02. Pathologists' Assistant Research Project II

Prerequisite(s): Must be registered in the Pathologists' Assistant Master's graduate program. Consent of instructor is required for all other students.

Note: Students are required to take both Medical Science 750.01 and Medical Science 750.02. After consultation with a Departmental faculty member who will supervise the chosen project, approval must be obtained from the Program Director before a student can register.

Medical Science 751 **3 units; H(3-0)**

Topics in Medical Science
751.07. The Physiological Development of the Fetus and Newborn

751.09. Ion Channel Diseases

751.31. Joint Injury and Disease Biomechanical Focus

751.43. Orientation and Clinical Rotations for Pathologists' Assistants

Prerequisite(s): Consent of the Faculty.

Note: Enrolment in Medical Science 751.43 is restricted to students registered in the Pathologists' Assistant Specialization in the Medical Science (Master's) graduate program.

Medical Science 755 **3 units; H(1-6)**

Directed Study
Lectures, seminars, term papers or training in theoretical and/or laboratory methods at the advanced level in the medical sciences.

Prerequisite(s): Consent of the Faculty.

Note: Submission of application is required to set up directed study topic. Forms available from the Graduate Science Education Office in the Cumming School of Medicine.

MAY BE REPEATED FOR CREDIT

Medicine MDCN

Instruction offered by members of the Cumming School of Medicine.

First Year Courses

Medicine 320 **(172 hours)**

Medical Skills
The medical skills required by students learning to optimize the physical, mental, emotional, and social well-being of patients (and self). Components include Communication, Physical Examination, Clinical Correlations, Ethics, Global Health, Physicianship, and Procedural Skills.

NOT INCLUDED IN GPA

Medicine 330 **(24 hours)**

Family Medicine Clinical Experience
Provides experience for early exposure to the discipline of Family Medicine and provide a real patient clinical learning environment so that students can practice their expanding patient assessment skills and enable them to integrate their accumulating knowledge. Students are matched with a Family Medicine Physician in a community, continuity of care urban or rural practice. All students attend orientation to FMCE prior to the clinical placement. Specific learning objectives relate to the practice of Family Medicine, how to document the patient encounter in an accurate SOAP note format and include specific clinical presentations that link with other concurrent courses.

NOT INCLUDED IN GPA

Medicine 340 **(76 hours)**

Population Health
Students will learn about concepts of health and disease as they apply to populations, communities and individual patients. The determinants of health and the distribution of disease within and between populations will be explored. The roles of health promotion, health protection and disease prevention will be presented. Students will learn about the evolution and function of the Canadian health care system in the context of current and historic challenges and international alternatives. Basic epidemiology and biostatistics as they apply to the core concepts of the course will be covered. Community experience with individuals and social/medical agencies is a core part of this course.

NOT INCLUDED IN GPA

Medicine 350 **(256 hours)**

Introduction to Medicine, Blood and Gastrointestinal Course
Integrated Clinical Presentations related to the Blood and Gastro-Intestinal systems. Students will learn how to diagnose, investigate and manage patients presenting with such clinical presentations as fever, anemia, bruising and bleeding, weight loss, difficulty swallowing, abdominal pain, jaundice, diarrhea, etc. General principles of medicine as a whole will be presented, including concepts of history and physical examination taking, as well as principles of investigations such as test sensitivity, specificity, positive and negative predictive value. This course will also introduced fundamental concepts of anatomy, histology, pathology and radiology. An approach to problems in infectious diseases and information regarding self-protection equipment and skills is provided.

NOT INCLUDED IN GPA

Medicine 360 **(148 hours)**

Integrated Musculoskeletal and Dermatology Course
Integrated Clinical Presentations related to the Musculoskeletal System and Dermatology. Students will learn how to diagnose, investigate and manage clinical presentations such as painful limb, joint pain, fractures and dislocations, skin lesions, etc.

NOT INCLUDED IN GPA

Medicine 370 **(224 hours)**

Integrated Cardiovascular and Respiratory Course
Integrated Clinical Presentations related to the Cardiovascular and Respiratory systems. Students will learn how to diagnose, investigate and manage clinical presentations such as chest pain, loss of consciousness, palpitations, shock, heart murmur, shortness of breath, cough, sore throat, etc.

NOT INCLUDED IN GPA

Second Year Courses

Medicine 402 **(4 weeks)**

Second Year Elective
The student selects an area of medicine of particular interest for more in depth study. Studies may be done in centres other than Calgary. Students are encouraged to consider experiences in developing world nations through the International Electives Program. All experiences must be evaluated by a preceptor.

NOT INCLUDED IN GPA

Medicine 410 **(224 hours)**

Integrated Renal-Electrolyte and Endocrine-Metabolic Course
Integrated Clinical Presentations related to the Renal and Endocrine systems. Students will learn how to diagnose, investigate and manage clinical presentations such as acute and chronic renal failure, generalized edema, hypertension, abnormal electrolytes, neck mass, abnormalities of blood lipids, diabetes, etc.

NOT INCLUDED IN GPA

Medicine 420 **(88 hours)**

Medical Skills
The medical skills required by students learning to optimize the physical, mental, emotional, and social well-being of patients (and self). Components include Communication, Physical Examination, Clinical Correlations, Ethics, Global Health, Physicianship and Procedural Skills.

NOT INCLUDED IN GPA

Medicine 430 **(24 hours)**

Family Medicine Clinical Experience
This one-on-one experience will provide an opportunity for early exposure to the discipline of Family Medicine and provide a real patient clinical learning environment for students to practice their expanding patient assessment skills and enable them to integrate their accumulating knowledge. This course is a continuation of Medicine 330 offered in Year 1. Students are matched with a Family Medicine Physician and will spend one day per month in their clinical practice. Specific learning objectives relate to the practice of Family Medicine and also include specific clinical presentations that link with other concurrent courses.

NOT INCLUDED IN GPA

Medicine 440 **(92 hours)**

Applied Evidence-Based Medicine
Provides an opportunity to explore in depth an area of particular interest to each student. Students under the supervision of a preceptor may complete a research project. Others may pursue a clinical experience utilizing critical appraisal skills to address questions related to prognosis, investigation and/or treatment. Alternatively, students may pursue supervised electives in such areas as History of Medicine, Pathology, Health Economics, Community Health, Palliative Care, Rehabilitation Medicine, etc. Concepts of clinical informatics and evidence-based medicine (including critical appraisal) will also be presented.

NOT INCLUDED IN GPA

Medicine 450 **(188 hours)**

Integrated Neurosciences, Special Senses and Aging Course
Integrated Clinical Presentations related to the Neuroscience system, Special Senses and Aging. Students will learn how to diagnose, investigate and manage clinical presentations such as muscle weakness, head and spinal injuries, gait disturbance, dizziness, speech and language disturbance, seizures, acute confusion, headache, dementia, falls, dying patient, visual loss, double vision, ear pain, hearing loss, etc.

NOT INCLUDED IN GPA

Medicine 460 **(188 hours)**

Children and Women's Health
Integrated Clinical Presentations related to Reproductive Medicine and Paediatrics. Students will learn how to diagnose, investigate and manage pregnancy, contraception, pelvic pain, infertility, breast mass, the well and unwell newborn, childhood communicable diseases (including disease such as pharyngitis, otitis media), genetics, etc.

NOT INCLUDED IN GPA

Medicine 470 **(76 hours)**

Psychiatry
Students will learn how to diagnose, investigate and manage clinical presentations such as substance abuse and drug addiction, suicidal behav-

iour, panic and anxiety, psychosis, mood disorders, personality disorders, etc.

NOT INCLUDED IN GPA

Medicine 480 (30 hours)

Integrative Course

Students work in small groups with a tutor and standardized patients (actors) to further improve their skills in interviewing, communication, physical examination, diagnosing and patient management. Basic science and clinical information across organ systems are integrated with an emphasis on clinical problem-solving ability.

NOT INCLUDED IN GPA

Medicine 490 (40 hours)

Introduction to Clinical Practice

Students are introduced to topics related to senior medical student responsibilities (clerk) such as writing orders, using the regional diagnostic and laboratory services, as well as more advanced ECG, radiological and procedural skills.

NOT INCLUDED IN GPA

Third Year Courses

The third and final year is called the Clinical Clerkship. The total period of studies in the Clinical Clerkship constitutes 56 weeks. During this time, students work on hospital wards, in ambulatory care clinics and doctors' offices as well as in the Emergency Room. All students will spend from 6 to 10 weeks in community hospitals in Southern Alberta learning Family Medicine as well as some specialties. During the clerkship students rotate through a variety of specialties spending from 2-10 weeks in each. These specialties include: Family Medicine, Internal Medicine, Surgery, Psychiatry, Paediatrics, Emergency Medicine, Anaesthesia, and Obstetrics and Gynaecology. Students also have 12 weeks of elective experience chosen from the courses listed below (Medicine 514). During this time students will apply the knowledge learned in the first 2 years and their clinical skills toward the solution of the most common clinical presentations. Students will evaluate patients and properly manage their medical problems by conducting a comprehensive medical history and thorough physical examination, formulating accurate hypotheses as to the causes and solution of their clinical problems, formulating and implementing a management plan to deal effectively with the problems. Students will demonstrate the fundamental concepts of disease prevention and health promotion for individual patients and incorporate them into treatments plans as appropriate. Students will communicate and interact effectively with patients, families, medical staff and others involved in the delivery of health services. During this time students will accept increasing responsibility in patient care as the final year advances. Students will be working with multi-disciplinary clinical teams of nurses, physiotherapists, residents and faculty. Students will develop and apply high ethical principles and standards in all aspects of medical practice and will exhibit appropriate personal and interpersonal professional behaviours. In the clerkship, as in the whole of the curriculum, it will be clear that physicians can serve patients to the highest possible standards only if they continually acquire new knowledge and skills for as long as they practice medicine.

Participation in Outreach Rotations: The clerkship program includes several community centres such as Medicine Hat, Lethbridge, Red Deer, and rural sites such as Brooks, Fort Macleod and Pincher Creek, etc. Students should expect to do from 5–10 weeks of their clinical clerkship outside the city of Calgary except in unusual circumstances.

Notes:

- There are two weeks set aside in January of the third year for students to attend the National Resident Interview Period for their residency application within the process of the Canadian Residency Matching Service (CaRMS).
- Up to 30 students per year may have the opportunity to achieve the objectives and evaluation requirements of the above stated disciplines in the University of Calgary Longitudinal Integrated Clerkship (UCLIC) an experience consisting of:
  - 32 weeks in a longitudinal rural preceptorship
  - 12 weeks of urban medicine (4 weeks Internal Medicine, 4 weeks Paediatrics, 4 weeks Surgery)
  - 12 weeks electives.

Medicine 502 (6 weeks)

Family Medicine

During this 6-week block the learning experience will consist of mostly clinical experience in a community setting. Common clinical problems associated with family medicine will be emphasized. The four principles of Family Medicine as identified by the College of Family Physicians of Canada will be highlighted.

502.01. Family Medicine

502.99. Family Medicine

NOT INCLUDED IN GPA

Medicine 504 (10 weeks)

Internal Medicine

During this 10-week block, clerks will develop their diagnostic and problem-solving skills by participating in a variety of clinical experiences and formal teaching rounds. The clinical experiences will consist of: a 4-week Medical Teaching Unit rotation, and three 2-week rotations on a more outpatient/consultative subspecialty, or one 4-week ICU rotation and one 2-week outpatient/consultative subspecialty. Formal teaching sessions include weekly bedside teaching, clinical Pharmacology, medical emergencies and "case of the week" rounds.

504.01. Internal Medicine

504.99. Internal Medicine

NOT INCLUDED IN GPA

Medicine 506 (6 weeks)

Surgery

This 6-week rotation covers a wide-range of surgical problems and specialties. Subsequently, students will rotate through 1. A 3-week General Surgery rotation and a 3-week Orthopedic Surgery rotation; OR 2. A 3-week General Surgery rotation and one 2-week rotation in either Orthopedic Surgery, Plastic Surgery or Urologocial Surgery along with one 1-week selective in either Urology, Vascular Surgery, Thoracic Surgery, Neurosurgery, Otolaryngology or Trauma Surgery.

506.01. Surgery

506.99. Surgery

NOT INCLUDED IN GPA

Medicine 508 (6 weeks)

Paediatrics

This 6-week rotation will provide clerks with a learning experience in paediatric medicine, emphasizing clinical skills and problem solving pertaining to common paediatric problems. The experience will build upon knowledge and skills (including history-taking and physical examination of newborns, infants, children, adolescents) previously gained in the first two years of the medical undergraduate curriculum, and will prepare the student for subsequent residency. The experiences shall be broad-based involving both ambulatory and hospital-based patients, and shall include newborn care, and care of children and adolescents up to the age of 18 years.

508.01. Paediatrics

508.99. Paediatrics

NOT INCLUDED IN GPA

Medicine 510 (6 weeks)

Psychiatry

This 6-week rotation will develop the students understanding of the psychiatric patient. Five weeks of the rotation is spent in Adult Psychiatry and one-week in Child Psychiatry. An additional option will be made available to a small number of students that will offer three weeks of Adult Psychiatry and three weeks of Child Psychiatry. Students will develop clinical skills in psychiatry in order to perform a psychiatric assessment and to demonstrate the basic principles of management of psychiatric clinical presentations with integration of basic knowledge obtained from the non-clinical setting. Clerks will perform a variety of assessments including: child and adolescent behavioural and learning assessments, elderly cognitive function, risk of fall, and competency assessments, safety assessments for suicide, abuse, and mental status examinations. They will order appropriate investigations including: collateral information, diagnostic imaging, laboratory and psychological and other functional assessments, etc.

510.01. Psychiatry

510.99. Psychiatry

NOT INCLUDED IN GPA

Medicine 512 (6 weeks)

Obstetrics and Gynaecology

During this 6-week block clerks will receive a broad exposure to women's health and focus on details essential to the practice of Obstetrics and Gynaecology. Clerks will experience direct patient care in both outpatient and inpatient settings, spend a 5-week block at either a community hospital in Calgary or Medicine Hat Regional hospitals, or at a tertiary care hospital. Clerks will develop history taking and physical examinations skills appropriate to obstetrics and gynaecology patients and will participate in deliveries. Fetal assessment, maternal fetal medicine, colposcopy, low risk obstetrics, infertility and urogynaecology will also be covered during this rotation.

512.01. Obstetrics and Gynaecology

512.99. Obstetrics and Gynaecology

NOT INCLUDED IN GPA

Medicine 514 **(12 weeks)**

Clerkship Electives
During these mandatory 12 weeks of clerkship, clerks will choose electives from the range of potential medical domains. Twelve weeks of mandatory elective time must be completed during the clerkship year with a minimum of two weeks on any one elective block.

514.01. Family Medicine
514.02. Complementary Medicine
514.03. Hospitalist Medicine
514.04. Anaesthesia
514.05. Public Health
514.06. International Health
514.07. Emergency Medicine
514.08. Cardiology
514.09. Dermatology
514.10. Endocrinology
514.11. Gastroenterology
514.12. General Internal Medicine
514.13. Geriatric Medicine
514.14. Palliative Care
514.15. Hematology
514.16. Immunology and Allergy
514.17. Infectious Diseases
514.18. ICU-Trauma
514.19. Nephrology
514.20. Medical Oncology
514.21. Neurology
514.22. Clinical Pharmacology
514.23. Pulmonary Medicine
514.24. Rheumatology
514.25. Physical Medicine and Rehabilitation
514.26. Cardiac Surgery
514.27. Thoracic Surgery
514.28. Vascular Surgery
514.29. General Surgery
514.30. Neurosurgery
514.31. Ophthalmology
514.32. Orthopedic Surgery
514.33. Otolaryngology
514.34. Plastic Surgery
514.35. Sport Medicine
514.36. Transplant Surgery
514.37. Trauma Surgery
514.38. Urology
514.39. Developmental Paediatrics
514.40. Community Paediatrics
514.41. Neonatology
514.42. Paediatric Anaesthesia
514.43. Paediatric Cardiology
514.44. Paediatric Critical Care Medicine
514.45. Paediatric Emergency Medicine
514.46. Paediatric Endocrinology
514.47. Paediatric Gastroenterology
514.48. Paediatric Hematology
514.49. Paediatric Infectious Diseases
514.50. Paediatric Nephrology
514.51. Paediatric Neurology
514.52. Paediatric Oncology
514.53. Paediatric Pulmonary Medicine
514.54. Paediatric Rheumatology
514.55. Paediatric Surgery
514.56. General Psychiatry
514.57. Child Psychiatry
514.58. Adolescent Medicine
514.59. Family Therapy
514.60. Neuropsychiatry
514.61. Psychiatric Assessment Services
514.62. Psychiatric Consultation Liaison
514.63. Forensic Psychiatry
514.64. General Obstetrics and Gynaecology
514.65. High Risk Obstetrics
514.66. Low Risk Obstetrics
514.67. Maternal Fetal Medicine
514.68. Urogynaecology
514.69. Gynaecologic Oncology
514.70. General Pathology
514.71. Forensic Pathology
514.72. Surgical Pathology
514.73. Molecular Pathology
514.74. Neuropathology
514.75. Oncologic Pathology
514.76. Renal and Transplant Pathology
514.77. Medical Genetics
514.78. Diagnostic Radiology
514.79. Radiation Oncology
514.80. Nuclear Medicine
514.81. Research
514.82. Other

NOT INCLUDED IN GPA

Medicine 516 **(2 weeks)**

Anaesthesia
During this 2-week rotation, students work daily with a preceptor in the hospital setting. In addition, four areas of anaesthesia will be covered: procedural skills, resuscitation, pharmacology as well as an overview of anaesthesia topics including: preoperative assessment, pain management and others. Clerks will practice intravenous cannulation, bag and mask ventilation, jaw thrust, laryngeal mask and airway insertion and airway and endotracheal intubation in a controlled setting.

516.01. Anaesthesia
516.99. Anaesthesia

NOT INCLUDED IN GPA

Medicine 520 **(60 hours)**

Comprehensive Clinical Skills Curriculum for Clerkship
To ensure that our curriculum is comprehensive, and consistent with the curricular format of the first two years, we have identified all the "must see" clinical presentations and designed learning experiences to ensure that each of these presentations is covered in at least one of the following formats: simulation, standardized patients, or virtual patients. The curriculum will run over a 48-week period. The curriculum will include a combination of didactic, small groups and simulation learning experience, and we will evaluate learning outcomes using a combination of summative and formative evaluations.

NOT INCLUDED IN GPA

Medicine 522 **(2 weeks)**

Emergency Medicine
During this two-week rotation, students will experience a minimum of six shifts in an urban emergency room at three teaching sites. During this rotation, students will experience the varied diagnostic and therapeutic challenges offered by emergency medicine, including the assessment and management of life threatening illness. The clerks will have access to all elements of health care delivery, including discharge planning, outpatient referrals, and direct interaction with consultants, ambulatory care and inpatient facilities, as well as diagnostic imaging. This type of integrated experience will provide the training physician with a unique and invaluable exposure to outpatient care not normally seen on the more typical inpatient rotations.

522.01 Emergency Medicine
522.99 Emergency Medicine

NOT INCLUDED IN GPA

Museum and Heritage Studies MHST

Instruction offered by the Department of Art in the Faculty of Arts.

Junior Course

Museum and Heritage Studies 201 **3 units; H(3-0)**

Introduction to Museum and Heritage Studies
Introduces the field of Museum and Heritage Studies by examining heritage sites, museums, art galleries, zoos, natural parks and others. Traditional institutions will be examined along with new forms, including virtual museums.

Note: Students may be required to attend off-campus events outside of class time.

Senior Courses

Museum and Heritage Studies 331 **3 units; H(3-0)**

Collections and Exhibitions in Museum and Heritage Institutions
Examines the nature of collecting, curating, exhibiting and interpreting material and non-material culture in museums and heritage institutions.

Prerequisite(s): Museum and Heritage Studies 201.

Note: Students may be required to attend off-campus events outside of class time. Enrolment preference is given to students registered in the Museum and Heritage Studies Minor program.

Museum and Heritage Studies 333 **3 units; H(3-0)**

Ethics in Museum Collection and Exhibition
Introduction to ethics in museums and heritage studies. An examination of some recent museums and heritage resources crises. Also museum/heritage processes including the acquisition of artifacts, exhibitions and the representation of indigenous and other minority peoples, interpretation, the appropriateness of conservation, and museum management.

Prerequisite(s): Museum and Heritage Studies 201.

Museum and Heritage Studies 401 **3 units; H(3-0)**

Special Topics in Museum and Heritage Studies
An examination of selected topics in Museum and Heritage Studies. See the Schedule of Classes for current topics.

Prerequisite(s): Museum and Heritage Studies 201 or consent of Program Co-ordinator.

MAY BE REPEATED FOR CREDIT

Museum and Heritage Studies 433 **3 units; H(0-3S)**

Management and Planning in Museum and Heritage Institutions
Examines theoretical and practical issues relating to the management of museum and heritage resources. Topics may include: exhibition planning, human resources, ethics and social responsibility, fundraising, collections, and audience development etc.

Prerequisite(s): Museum and Heritage Studies 201.

Corequisite(s): Prerequisite or Corequisite: Museum and Heritage Studies 331.

Note: Students may be required to attend off-campus events outside of class time. Preference is given to students registered in the Museum and Heritage Studies Minor program.

Museum and Heritage Studies 501 **3 units; H(3-0)**

Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Program Co-ordinator.

Note: Students should contact the Program Co-ordinator well in advance of the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Museum and Heritage Studies 533 **3 units; H(0-6)**

Practicum
Volunteer placement at a local museological or heritage institution under a professional supervisor.

Corequisite(s): Prerequisites or Corequisites: Museum and Heritage Studies 331, 433 and consent of the Museum and Heritage Studies Program Co-ordinator.

Note: This should be the last course students take in the program, grounding their theoretical knowledge and helping to launch careers. Students must contact the Museum and Heritage Studies Program Co-ordinator at least three weeks prior to the start of classes to arrange for placement at a hosting institution.

NOT INCLUDED IN GPA

Music MUSI

Instruction offered by members of Music in the School of Creative and Performing Arts in the Faculty of Arts.

Music majors may count no more than 6 units (1.0 full-course equivalent) from Music 201, 301, 302, 304, 305, 401, 402 and 405 as Open Options toward their degree. Minors in Music may count no more than 6 units (1.0 full-course equivalent) from Music 201, 301, 302, 304, 305, 401, 402 and 405 for credit to their degree.

Music 101 **0 units; H(0-2)**
(formerly Music Performance 101)

Music Listening I
NOT INCLUDED IN GPA

Music 102 **0 units; H(0-2)**
(formerly Music Performance 102)

Music Listening II
NOT INCLUDED IN GPA

Music 103 **0 units; H(0-2)**
(formerly Music Performance 103)

Music Listening III
NOT INCLUDED IN GPA

Music 104 **0 units; H(0-2)**
(formerly Music Performance 104)

Music Listening IV
Note: The above activity courses offer practical experience in music listening and are only open to BMus, BA (Music) and BA Honours (Music) students. Only one course is offered per year. Credit for four courses is required for graduation.

NOT INCLUDED IN GPA

Music 127 **3 units; H(0-3)**
(formerly Music Performance 271)

Class Piano
Functional approach to the piano.

Prerequisite(s): Admission to a BMus program.

Note: May not be used for credit towards any degree program.

NOT INCLUDED IN GPA

Junior Courses

Music 201 **3 units; H(3-0)**
(formerly Music History and Literature 209)

Music Past and Present
Directed listening to and study of important music of the past and present. Content may vary from year to year. Intended for non-majors.

Music 203 **3 units; H(3-0)**
(formerly Music History and Literature 281)

Jazz History
Directed listening and analysis of jazz forms from the early beginnings of jazz to the present. Styles examined range from Early Jazz to Jazz-Rock Fusion. Major figures considered include: Louis Armstrong, Duke Ellington, Count Basie, Lester Young, Charlie Parker, Miles Davis and John Coltrane.

Note: Music Majors and Minors may use this course for credit towards their programs.

Music 209 **3 units; H(3-0)**
(formerly Music Theory and Composition 209)

Introduction to Music Theory for Non-Majors
Introduction to the materials of music through development of both aural and written skills.

Note: Open to all students. Not available for credit toward BMus, BA (Music) and Music Minor programs.

NOT INCLUDED IN GPA

Music 211 **3 units; H(3-0)**
(formerly Music Theory and Composition 201)

Materials of Music
Investigation of the fundamental processes of music through analytical and written exercises.

Prerequisite(s): Music 209 or the successful completion of the Music Theory Diagnostic exam.

Note: The diagnostic exam is given in March and during the Fall Block Week each year. Contact the School of Creative and Performing Arts for more information.

Music 213 **3 units; H(3-0)**
(formerly Music Theory and Composition 203)

Diatonic Harmony
Part-writing and analysis with an emphasis on diatonic harmony and modulation in the music of the eighteenth century.

Prerequisite(s): Music 211 or Music Theory and Composition 201.

Music 221 **3 units; H(1-3)**
(formerly Music Performance 291)

Performance Practicum I
Applied instruction in instrument or voice.

Prerequisite(s): Admission to the BMus program.

Note: Students not admitted to the BMus program may register with an audition and consent of the Division Chair, Music.

Music 223 **3 units; H(1-3)**
(formerly Music Performance 293)

Performance Practicum II
Continuation of applied instruction in instrument or voice.

Prerequisite(s): Music 221 or Music Performance 291 and admission to the BMus program.

Note: Students not admitted to a BMus program may register with an audition and consent of the Division Chair, Music.

Music 225 **3 units; H(0-6)**
(formerly Music Theory and Composition 221)

Musicianship I
Development of skills in rhythm, intonation and sight-singing. Performance of two-part contrapuntal exercises with diatonic modulation.

Prerequisite(s): Admission to the Music major or minor.

Note: Students not admitted to a Music major or minor may register by audition and consent of the Division Chair, Music. This course meets for three hours per week during the Fall and Winter Terms.

Music 231 **3 units; H(3-0)**
(formerly Music History and Literature 201)

Medieval and Renaissance Music
Music from antiquity to 1600.

Prerequisite(s): Admission to the Music major or minor.

Note: Students not admitted to the Music major or minor may register by audition and consent of the Division Chair, Music.

Music 233 **3 units; H(3-0)**
(formerly Music History and Literature 203)

Baroque Music
Music from 1600 to 1750.

Prerequisite(s): Music 231 or Music History and Literature 201.

Senior Courses

Music 301 **3 units; H(3-0)**
(formerly Music History and Literature 309)

Music and Popular Culture
Survey and specific examination of popular music and culture, ranging from classical styles to rock, within an historical and sociological context. The course will examine the meaning and messages of popular music, and its impact on present-day culture. Topics may include The Beatles and Rolling Stones, Rock and Roll, Black Music, jazz, music and media, blues, Sinatra, Broadway and others.

Music 302 **3 units; H(3-0)**
(formerly Music History and Literature 309)

Music in Popular Culture: Performers
Study of the impact of performers on the history of commercial music, focusing on selected performers such as The Beatles, Rolling Stones, Led Zeppelin, James Brown or Jimi Hendrix.

Music 303 **3 units; H(3-0)**
(formerly Music History and Literature 309.28)

World Music
Detailed ethno-musicological examination of non-western traditions.

Note: Music Majors and Minors may use this course for credit toward their programs.

Music 304 **3 units; H(3-0)**
(formerly Music History and Literature 309)

Music in Popular Culture: Musical Theatre
Study of music and its relation to popular theatre (operetta and/or musicals) in a historical context through the examination of selected works and their relation to popular culture, popular song and/or jazz.

Note: The Spring Intersession offering of this course is normally a travel-study course.

Music 305 **3 units; H(3-0)**
(formerly Music History and Literature 311)

Composers and Musical Cultures
In-depth study of selected composers, their music, and their relationship to intellectual history (i.e. Mozart and the French Revolution), and/or examinations of specific western and non-western musical cultures (i.e. Music in India, Music in post-war Germany) and their impact. Attendance at relevant musical concerts and lectures may be required.

Music 309 **3 units; H(3-0)**
(formerly Music Theory and Composition 351)

The Art of Music Listening
An introduction to the sensuous and structural elements of music, leading to a greater appreciation for the art of music in a global multi-cultural context.

Note: Music Majors and Minors (except Sonic Arts Minors) may not use the course for credit towards their programs.

Music 311 **3 units; H(3-0)**
(formerly Music Theory and Composition 301)

Chromatic Harmony
Part-writing and analysis with an emphasis on chromatic harmony and modulation in the music of the nineteenth century.

Prerequisite(s): Music 213 or Music Theory and Composition 203.

Music 313 **3 units; H(3-0)**
(formerly Music Theory and Composition 303)

Materials of Twentieth Century Music
Compositional and analytical approaches to post-tonal music from the twentieth century to the present.

Prerequisite(s): Music 311 or Music Theory and Composition 301.

Music 321 **3 units; H(1-3)**
(formerly Music Performance 391)

Performance Practicum III
Continuation of Music 223.

Prerequisite(s): Music 223 or Music Performance 293 and admission to the BMus program. Students not admitted to a BMus program may register with an audition and consent of the Division Chair, Music.

Music 323 **3 units; H(1-3)**
(formerly Music Performance 393)

Performance Practicum IV
Continuation of Music 321.

Prerequisite(s): Music 321 or Music Performance 391 and admission to the BMus program. Students not admitted to a BMus program may register with an audition and consent of the Division Chair, Music.

Music 325 **3 units; H(0-6)**
(formerly Music Theory and Composition 321)

Musicianship II
Further development of skills in rhythm, intonation and sight-singing. Performance of two-part contrapuntal exercises with chromatic modulation. Introduction to atonal exercises.

Prerequisite(s): Music 225 or Music Theory and Composition 221.

Note: This course meets for three hours per week during the Fall and Winter Terms.

Music 327 **3 units; H(1-3)**
(formerly Music Performance 395)

Second Instrument Study
Applied instruction on second instrument or voice.

327.01 Second Instrument Study I

327.02 Second Instrument Study II

327.03 Second Instrument Study III

327.04 Second Instrument Study IV

327.05 Second Instrument Study V

327.06 Second Instrument Study VI

327.07 Second Instrument Study VII

327.08 Second Instrument Study VIII

Prerequisite(s): Open to Music Majors with consent of the Division Chair, Music.

Music 329 **3 units; H(0-3)**
(formerly Music Theory and Composition 385)

Jazz Musicianship
Musicianship in the jazz idiom, stressing the aural perception of jazz scales and modes, seventh-chord and harmonic extensions, common jazz progressions and jazz rhythms.

Prerequisite(s): Music 211 or Music Theory and Composition 201.

Note: Open to both Music Majors and Minors.

Music 331 **3 units; H(3-0)**
(formerly Music History and Literature 301)

Classical and Romantic Music
Music from 1750 to 1870.

Prerequisite(s): Music 233 or Music History and Literature 203.

Music 333 **3 units; H(3-0)**
(formerly Music History and Literature 305)

Late Romantic and Modern Music
Music from 1870 to the present.

Prerequisite(s): Music 331 or Music History and Literature 301.

Music 341 **3 units; H(3-0)**
(formerly Music Theory and Composition 391)

Composition I
Basic compositional techniques, and study of selected twentieth century compositions.

Prerequisite(s): Music 213 or Music Theory and Composition 203.

Music 343 **3 units; H(3-0)**
(formerly Music Theory and Composition 393)

Composition II
Continuation of Music 341.

Prerequisite(s): Music 341 or Music Theory and Composition 391.

Music 351 **3 units; H(3-0)**
(formerly Music Theory and Composition 379)

Sonic Arts
An introduction to the creative use of computers and digital media in sonic arts.

Music 355 **3 units; H(3-0)**
(formerly Music Theory and Composition 361)

Sound Recording
An introduction to the practice and theory of sound and music recording.

Music 401 **3 units; H(3-0)**
(formerly Music History and Literature 307)

Music and the Humanities
Study of the interrelationship of music and the humanities in a broad cultural and historical framework. Content may vary from year to year. Intended for non-majors.

Music 402 **3 units; H(3-0)**

Topics in Popular Music
Selected topics examining commercial music from a critical perspective. Topics may include the examination of the work of specific creators or performers, the recording industry, the impact of specific instruments (guitar, percussion, electronic media, etc.), or cross-cultural influences.

MAY BE REPEATED FOR CREDIT

Music 403 **3 units; H(3-0)**

Topics in World Music
Selected topics examining World Music from an historical, sociological, analytical or performative perspective. Topics may include the study of a particular musical tradition and repertoire or the study of an instrument or performance practice that appears among many traditions (for example, hand-drumming).

Note: Music Majors and Minors may use this course for credit toward their programs.

MAY BE REPEATED FOR CREDIT

Music 405 **3 units; H(3-0)**

Topics in Musical Culture
Selected topics examining the relationship between composers and or performers and a musical culture, focusing on repertoire (for example piano music, art song, or orchestral music of a specific era), aesthetic or technical approach (such as sonic arts or improvisation), or artistic milieu (such as fin de siècle Paris or post-1960's Montréal).

MAY BE REPEATED FOR CREDIT

Music 415 3 units; H(3-0)
(formerly Music Theory and Composition 471)

Form and Analysis
Investigations into hierarchical relations in music. Study of how various levels of musical structure relate in order to form a whole.

Prerequisite(s): Music 313 or Music Theory and Composition 303.

Music 417 3 units; H(3-0)
(formerly Music Theory and Composition 473)

Advanced Harmonic Analysis
Investigation of the expanded harmonic resources and analytical systems used by composers from the late nineteenth century to the present.

Prerequisite(s): Music 313 or Music Theory and Composition 303.

Music 421 3 units; H(1-3)
(formerly Music Performance 491)

Performance Practicum V
Continuation of Music 323.

Prerequisite(s): Music 323 or Music Performance 393 and admission to the BMus (Composition, Music History and Theory, or Integrated Studies) program. Students not admitted to the stated BMus programs may register with an audition and consent of the Division Chair, Music.

Music 423 3 units; H(1-3)
(formerly Music Performance 493)

Performance Practicum VI
Continuation of Music 421.

Prerequisite(s): Music 421 or Music Performance 491 and admission to the BMus (Composition, Music History and Theory, or Integrated Studies) program. Students not admitted to the stated BMus programs may register with an audition and consent of the Division Chair, Music.

Music 427 3 units; H(4S-0)
(formerly Music Performance 469)

Professional Seminar in Music Performance I
Practical experience in music performance in a team teaching master class format.

Prerequisite(s): Music 323 or Music Performance 393, and admission to the BMus (Performance) program.

Corequisite(s): Music 462.

Note: This course meets for two hours per week during the Fall and Winter Terms.

Music 429 3 units; H(2-2)
(formerly Music Performance 481)

Topics in Jazz Improvisation
Topics in jazz improvisation, stressing improvisational tools, melody, rhythm, and ear development for the blues progression.

Prerequisite(s): Music 211 or Music Theory and Composition 201 and admission to the music major or minor.

Music 441 3 units; H(1-2)
(formerly Music Theory and Composition 491)

Composition III
Advanced creative work with an emphasis upon either chamber music composition or studio composition. Individual instruction and group seminars.

Prerequisite(s): Music 343 or Music Theory and Composition 393 and consent of the Division Chair, Music.

Music 443 3 units; H(1-2)
(formerly Music Theory and Composition 493)

Composition IV
Continuation of Music 441. Individual instruction and group seminars.

Prerequisite(s): Music 441 or Music Theory and Composition 491 and consent of the Division Chair, Music.

Music 445 3 units; H(3-0)
(formerly Music Theory and Composition 475)

Counterpoint
Practical study of contrapuntal technique, including species counterpoint and eighteenth century counterpoint.

Prerequisite(s): Music 313 or Music Theory and Composition 303.

Music 447 3 units; H(3-0)
(formerly Music Theory and Composition 477)

Orchestration
Practical study of instrumentation and scoring, including orchestral and wind ensemble textures.

Prerequisite(s): Music 313 or Music Theory and Composition 303.

Music 451 3 units; H(3-0)
(formerly Music Theory and Composition 479)

Electroacoustic Music
Practical study of electroacoustic and computer music with an emphasis on creative work in the medium.

Music 453 3 units; H(3-0)
(formerly Music Theory and Composition 481)

Computer Applications in Music
Use of computers in music composition, performance, education and interdisciplinary media.

Music 462 6 units; F(1-4)
(formerly Music Performance 498)

Junior Performance Project
Applied instruction in instrument or voice in connection with junior recital.

Prerequisite(s): Admission to the BMus (Performance) program.

Music 511 3 units; H(3-0)
(formerly Music Theory and Composition 575)

Selected Topics in Theory and Composition
Advanced topics in music theory and composition selected from such subjects as: analysis of tonal or post-tonal music, rhythmic analysis, acoustics, critical approaches to music theory, electroacoustic music, orchestration, counterpoint and fugue.

Prerequisite(s): One of Music 415, 417, 445, 447, 451 or one of Music Theory and Composition 471, 473, 475, 477, 479.

MAY BE REPEATED FOR CREDIT

Music 513 3 units; H(3S-0)
(formerly Music Theory and Composition 577)

Seminar in Theory and Composition
Creative and analytic approaches to the study of selected repertoire with an emphasis upon contemporary music.

Prerequisite(s): One of Music 415, 417, 445, 447, 451 or one 400-level Music Theory and Composition course.

MAY BE REPEATED FOR CREDIT

Music 521 3 units; H(1-3)
(formerly Music Performance 591)

Performance Practicum VII
Continuation of Music 423.

Prerequisite(s): Music 423 or Music Performance 493 and admission to the BMus (Composition, Music History and Theory, or Integrated Studies) program. Students not admitted to the stated BMus programs may register with an audition and consent of the Division Chair, Music.

Music 523 3 units; H(1-3)
(formerly Music Performance 593)

Performance Practicum VIII
Continuation of Music 521.

Prerequisite(s): Music 521 or Music Performance 591 and admission to the BMus (Composition, Music History and Theory, or Integrated Studies) program. Students not admitted to the stated BMus programs may register with an audition and consent of the Division Chair, Music.

Music 525 3 units; H(3-0)
(formerly Music Performance 571)

Topics in Music Performance
Various topics such as applied music literature, piano, wind or string pedagogy, or vocal pedagogy, phonetics.

Prerequisite(s): Admission to the BMus or BA(Music) Program and consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Music 527 3 units; H(4S-0)
(formerly Music Performance 569)

Professional Seminar in Music Performance II
Continuation of Music 427.

Prerequisite(s): Music 427 or Music Performance 469, and admission to the BMus (Performance) program.

Corequisite(s): Music 562.

Note: This course meets for two hours per week during the Fall and Winter Terms.

Music 531 3 units; H(3-0)
(formerly Music History and Literature 551)

Research Techniques and Bibliography of Music
Exploring the basic reference materials and techniques for musical research in all areas.

Prerequisite(s): Music 333 or Music History and Literature 305.

Music 533 3 units; H(3-0)
(formerly Music History and Literature 571)

Selected Topics in Musicology
A specific musical medium or genre: may include chamber music literature, symphonic literature, dramatic literature and program music.

Prerequisite(s): Music 333 or Music History and Literature 305.

MAY BE REPEATED FOR CREDIT

Music 535 3 units; H(3-0)
(formerly Music History and Literature 573)

Studies in the Music of Selected Composers
Specific composers or groups of composers; may include Beethoven, Debussy, the Second Viennese School, etc.

Prerequisite(s): Music 333 or Music History and Literature 305.

MAY BE REPEATED FOR CREDIT

Music 551 3 units; H(3-0)
(formerly Music Theory and Composition 505)

Networked Music Performance
Investigation of music performance on high-speed networks.

Music 560 6 units; F(1-4)
(formerly Music History and Literature 596, 598, Music Theory and Composition 596, 598)

Senior Project
Major research or creative project in an area of musical study.

Prerequisite(s): Consent of the Division Chair, Music.

Music 561 3 units; H(3-0)
(formerly Music History and Literature 555, Music Theory and Composition 555, Music Performance 555)

Independent Study
Individual study in a selected area of music.

Prerequisite(s): Consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Music 562 6 units; F(1-4)
(formerly Music Performance 598)

Senior Performance Project
Applied instruction in instrument or voice in connection with senior recital.

Prerequisite(s): Admission to the BMus (Performance) program, Music 313 or Music Theory and Composition 303, and Music 333 or Music History and Literature 305.

Graduate Courses

Music 611 3 units; H(3-1)
(formerly Music Theory and Composition 673)

Selected Topics in Theory and Composition
Various topics (master's level).

Music 613 3 units; H(3S-0)
(formerly Music Theory and Composition 671)

Seminar in Theory and Composition
Advanced creative and analytic approaches to the study of selected repertoire with an emphasis upon contemporary music.

MAY BE REPEATED FOR CREDIT

Music 615 3 units; H(3-0)
(formerly Music Theory and Composition 675)

Pedagogy of Music Theory
Refining ideas about music theory and its teaching, while developing and strengthening teaching skills.

Note: Required course for all PhD (Composition) students.

Music 621 3 units; H(2-3)
(formerly Music Performance 691)

Advanced Performance Practicum I
Applied instruction in instrument or voice.

Music 623 3 units; H(2-3)
(formerly Music Performance 693)

Advanced Performance Practicum II
Continuation of Music 621.

Prerequisite(s): Music 621 or Music Performance 691.

Music 625 3 units; H(3-0)
(formerly Music Performance 671)

Topics in Music Performance
Various topics such as applied music literature, applied pedagogy, accompanying, phonetics and others.

MAY BE REPEATED FOR CREDIT

Music 629 3 units; H(0-3)
(formerly Music Performance 657)

Studies at the Banff Centre
Advanced music studies.

Note: Although the Banff Centre does not provide credit course instruction, students with advanced experience in music at the Banff Centre may apply for graduate-level credit from the University of Calgary.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music 631 3 units; H(3-0)
(formerly Music History and Literature 651)

Research Techniques and Bibliography of Music
Exploring the basic reference materials and techniques for musical research at the graduate level.

Note: Required course for all MMus and MA (Musicology) students.

Music 633 3 units; H(3-0)
(formerly Music History and Literature 671)

Selected Topics in Musicology
Various topics such as history of music theory, analysis, notation, or performance practice may be offered. Consult the timetable for current topic.

MAY BE REPEATED FOR CREDIT

Music 637 3 units; H(3S-0)
(formerly Music History and Literature 603)

Pro-Seminar in Music for Graduate Students
Selected works of music from the middle ages to the present in an analytical and historical context.

Note: Required course for all MMus and MA (Musicology) students.

Music 641 3 units; H(2-2)
(formerly Music Theory and Composition 695)

Composition
MAY BE REPEATED FOR CREDIT

Music 645 3 units; H(2S-2)
(formerly Music Theory and Composition 691)

Composition Seminar
Prerequisite(s): Consent of the Division Chair, Music.

Music 651 3 units; H(3-0)
(formerly Music Theory and Composition 685)

Selected Topics in Electroacoustic Music
Advanced topics in computer music selected from such subjects as: analysis, theory and aesthetics of electroacoustic repertoire, computer programming and software design, interactivity, performance practice and interpretation, sound morphology, sound spatialization, sound synthesis, soundscape studies, tele-media.

MAY BE REPEATED FOR CREDIT

Music 653 3 units; H(3-0)
(formerly Music Theory and Composition 681)

Projects in Computer Music
Individual and collaborative creative and research projects in computer music.

MAY BE REPEATED FOR CREDIT

Music 661 3 units; H(3-0)
(formerly Music History and Literature 655, Music Theory and Composition 655, Music Performance 655)

Independent Study
Individual study in a selected area of music.

MAY BE REPEATED FOR CREDIT

Music 711 3 units; H(3-0)
(formerly Music Theory and Composition 775)

Advanced Topics in Theory and Composition
Various topics (doctoral level).

MAY BE REPEATED FOR CREDIT

Music 733 3 units; H(3-0)
(formerly Music History and Literature 771)

Selected Topics in Musicology
Various topics in the field of Musicology (doctoral level).

MAY BE REPEATED FOR CREDIT

Music 741 3 units; H(3-0)
(formerly Music Theory and Composition 795)

Composition
Individual study in musical composition (doctoral level).

MAY BE REPEATED FOR CREDIT

Music 751 3 units; H(3-0)
(formerly Music Theory and Composition 785)

Advanced Topics in Electroacoustic Music
Advanced topics in computer music selected from such subjects as: interactivity, tele-media, sound morphology, sound spatialization, analysis, theory and aesthetics, performance practice and interpretation, computer programming and software design, sound synthesis, soundscape studies.

MAY BE REPEATED FOR CREDIT

Music 753 3 units; H(3-0)
(formerly Music Theory and Composition 781)

Advanced Projects in Computer Music
Individual and collaborative creative and research projects in computer music.

MAY BE REPEATED FOR CREDIT

Music 761 3 units; H(3-0)
(formerly Music Theory and Composition 755)

Independent Study
Individual study in a selected area of music (doctoral level).

MAY BE REPEATED FOR CREDIT

Music Education MUED

Instruction offered by members of the School of Creative and Performing Arts in the Faculty of Arts.

Senior Courses

Music Education 331 **3 units; H(3-0)**

Conducting I
Basic conducting techniques with the use of the baton; simple and condensed scores for selected choral and instrumental works.

Prerequisite(s): Music 211 and 225 or Music Theory and Composition 203 and 221.

Music Education 333 **3 units; H(3-0)**

Conducting II
Continuation of Music Education 331; the full score and more difficult choral and instrumental works.

Prerequisite(s): Music Education 331.

Music Education 401 **3 units; H(3-2.5)**

Instrumental and Band Techniques I
Performing and teaching techniques for instruments used in the schools.

Prerequisite(s): Music Education 333.

Music Education 403 **3 units; H(3-2.5)**

Instrumental and Band Techniques II
Continuation of Music Education 401. Musical and practical aspects of band conducting, including teaching skills, curriculum and appropriate teaching strategies.

Prerequisite(s): Music Education 401.

Music Education 413 **3 units; H(3-0)**

Vocal Music in the School I
Introduction to a comprehensive vocal program for elementary and secondary classrooms, including teaching methods and materials.

Prerequisite(s): Music Education 333.

Music Education 415 **3 units; H(3-0)**

Vocal Music in the School II
Continuation of Music Education 413. Musical and practical aspects of vocal music in the classroom, including teaching skills, curriculum and appropriate teaching strategies.

Prerequisite(s): Music Education 413.

Music Education 417 **3 units; H(3-2)**

Topics in Music Education
Various topics such as advanced band techniques and literature, choral techniques and literature, philosophy and foundation of music education or jazz for the classroom.

Prerequisite(s): Music Education 333.

MAY BE REPEATED FOR CREDIT

Music Education 555 **3 units; H(3-0)**

Independent Study
Individual study in a selected music education area.

Prerequisite(s): Consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Music Education 655 **3 units; H(3-0)**

Independent Study
Individual study in a selected music education area.

Prerequisite(s): Consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Music Education 671 **3 units; H(3-0)**

Selected Topics in School Music
Selected topics with emphasis upon practical application relevant to the field of music education. Various topics are regularly offered under this title, such as early childhood, Kodaly pedagogy, administration of school music programs and techniques of school music supervision.

Prerequisite(s): Consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Music Education 695 **3 units; H(2-4)**

Practicum in School Music I
Practical application of teaching techniques studied in graduate level school music courses. Will include various topics such as early childhood, Kodaly, choral and instrumental.

Music Education 697 **3 units; H(2-4)**

Practicum in School Music II
Continuation of Music Education 695.

Music Education 755 **3 units; H(3-0)**

Independent Study
Individual directed study in an area of Music Education (doctoral level).

Prerequisite(s): Consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Music Education 771 **3 units; H(3-0)**

Selected Topics in Music Education
Selected topics with emphasis upon practical application relevant to the field of Music Education. Possible topics may include early childhood musical development, Kodaly pedagogy, folk music studies, choral and instrumental pedagogy and the role of new technologies within the discipline.

Prerequisite(s): Consent of the Division Chair, Music.

MAY BE REPEATED FOR CREDIT

Music Performance MUPF

Instruction offered by members of Music in the School of Creative and Performing Arts in the Faculty of Arts.

Students are cautioned that notwithstanding the given prerequisite, registration in any of the performing ensembles is subject to the approval of the ensemble director.

Further information on ensembles is available at scpa.ucalgary.ca/music/welcome-music.

Junior Courses

Music Performance 201 **3 units; H(0-6)**

Chamber Choir
Performing experience in the Chamber Choir.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Music Performance 203 **3 units; H(0-6)**

Women's Choir
Performing experience in the Women's Choir.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Music Performance 205 **3 units; H(0-6)**

University Chorus
Performing experience in the University Chorus.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Music Performance 211 **3 units; H(0-6)**

Symphonic Band
Performing experience in the Symphonic Band.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Music Performance 213 **3 units; H(0-6)**

Wind Ensemble
Performing experience in the Wind Ensemble.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Music Performance 215 **3 units; H(0-6)**

University Orchestra
Performing experience in the University Orchestra.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

NOT INCLUDED IN GPA

Music Performance 221 **3 units; H(0-6)**

Collegium Musicum
Performance of instrumental and vocal music written before 1750.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is

unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

Music Performance 223 3 units; H(0-6)

Vocal Jazz Ensemble
Performance of popular vocal literature.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

Music Performance 225 3 units; H(0-6)

Instrumental Jazz Ensemble
Performance in a jazz combo or band.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

Music Performance 227 3 units; H(0-6)

New Music Ensemble
Performance of chamber music written since 1960.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

Music Performance 229 3 units; H(0-6)

World Music Ensemble
Performing experience of various world music traditions.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

Music Performance 241 3 units; H(0-4)

Chamber Music
Performance of music for small ensembles.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets during both the Fall and Winter Terms and in addition to regular rehearsals, includes one hour of coaching per week.

Senior Courses

Music Performance 301 3 units; H(0-6)

Chamber Choir
Performing experience in the Chamber Choir.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music Performance 303 3 units; H(0-6)

Women's Choir
Performing experience in the Women's Choir.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music Performance 305 3 units; H(0-6)

University Chorus
Performing experience in the University Chorus.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music Performance 311 3 units; H(0-6)

Symphonic Band
Performing experience in the Symphonic Band.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music Performance 313 3 units; H(0-6)

Wind Ensemble
Performing experience in the Wind Ensemble.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music Performance 315 3 units; H(0-6)

University Orchestra
Performing experience in the University Orchestra.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Music Performance 321 3 units; H(0-6)

Collegium Musicum
Performance of instrumental and vocal music written before 1750.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

Music Performance 323 3 units; H(0-6)

Vocal Jazz Ensemble
Performing experience in the Vocal Jazz Ensemble.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

Music Performance 325 3 units; H(0-6)

Instrumental Jazz Ensemble
Performing experience in the Instrumental Jazz Ensemble.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

Music Performance 327 3 units; H(0-6)

New Music Ensemble
Performing experience in the New Music Ensemble.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

Music Performance 329 3 units; H(0-6)

World Music Ensemble
Performing experience in the World Music Ensemble.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets for three hours per week during the Fall and Winter Terms.

MAY BE REPEATED FOR CREDIT

Music Performance 341 3 units; H(0-4)

Chamber Music
Performing of music for small ensembles.

Note: Open to all University of Calgary students. Admission based on auditions held during the first week of classes in September. If the audition is unsuccessful, the responsibility for cancelling or changing the registration lies with the student. This course normally meets during both the Fall and Winter Terms and in addition to regular rehearsals, includes one hour of coaching per week.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Music Performance 632 **6 units; F(2-3)**

Advanced Choral Conducting
Prerequisite(s): Consent of the Division Chair, Music.

Music Performance 634 **6 units; F(2-3)**

Advanced Instrumental Conducting
Prerequisite(s): Consent of the Division Chair, Music.

Music Performance 641 **3 units; H(0-4)**

Advanced Chamber Ensemble I
Intensive coaching in chamber ensembles.

Prerequisite(s): Consent of the Division Chair, Music.

Music Performance 643 **3 units; H(0-4)**

Advanced Chamber Ensemble II
Continuation of Music Performance 641.

Prerequisite(s): Music Performance 641 or consent of the Division Chair, Music.

Nanoscience NANS

Instruction offered by members of the Faculty of Science.

Senior Courses

Nanoscience 301 **3 units; H(3-0)**

Introduction to Nanoscience and Nanotechnology
Functional definitions of nanoscience and nanotechnology. Understanding/predicting the behaviour of nanomaterials. Investigation of nanomaterials whose properties depend on size. Exploration of a building up approach to design and fabrication of functional nanomaterials. Examination of applications of nanoscience and nanotechnology in society.

Prerequisite(s): 18 units (3.0 full-course equivalents) in courses offered by the Faculty of Science.

Nanoscience 401 **3 units; H(3-0)**

Design in Nanoscience
The fundamental understanding of Nanoscience gained in Nanoscience 301 will be extended and applied to designing experiments and simulations to test hypotheses regarding Nanoscience.

Prerequisite(s): Nanoscience 301.

Nanoscience 443 **3 units; H(3-0-1T)**

Quantum World of Nanoscience
Using nanotechnology examples, the fundamentals of quantum mechanics that are relevant to nanoscience and nanotechnology are covered.

Prerequisite(s): Applied Mathematics 217 or Mathematics 275 or Mathematics 249, 251 or 265 or 281 and Mathematics 211 or 213 and Physics 223 and 255.

Antirequisite(s): Credit for Nanoscience 443 and Physics 543 will not be allowed.

Note: Open only to Nanoscience Concentrators or Minors, or by consent of the Program Director. Prior or concurrent completion of Applied Mathematics 219 or Mathematics 253 or 283 is strongly recommended.

Nanoscience 502 **6 units; F(0-6)**

Nanoscience Methods
This lab/tutorial course will place the students in a nanotechnology setting. Students will design and execute self-directed projects and will present results to their peers.

Prerequisite(s): Nanoscience 401.

Note: Open only to Nanoscience Minors, or by consent of the Program Director.

Nanoscience 511 **3 units; H(3-0)**

Integration of Nanotechnology and Biology for Medical Applications
The use of nanoscience and nanotechnology principles for medical applications in diagnostics and therapy will be explored in lectures, student presentations and group projects.

Prerequisite(s): Nanoscience 401.

Nanoscience 599 **3 units; H(3-0)**

Special Problems in Nanoscience and Nanotechnology
A discussion of current topics in Nanoscience and Nanotechnology. This seminar course will place the student in a setting where best practices of scientific presentation are imparted through giving presentations related to Nanoscience

Prerequisite(s): Nanoscience 301.

MAY BE REPEATED FOR CREDIT

Neuroscience NEUR

Instruction and services offered by members of the Cumming School of Medicine and the Faculties of Science and Arts.

Junior Course

Neuroscience 201 **3 units; H(3-0)**

Introduction to Neuroscience
A survey of clinical, cognitive, behavioural, systems, cellular and molecular neuroscience, with emphasis on applied, translational, and basic research.

Prerequisite(s): Biology 30 and admission to the Neuroscience program.

Senior Courses

Neuroscience 301 **3 units; H(160 hours)**

Neuroscience Field Course
Introductory ethology and behavioural neuroscience research. Hypothesis generation, experimental design, data collection and analysis, techniques, and experimentation.

Prerequisite(s): Biology 231 or 241 and Neuroscience 201 and admission to the Neuroscience program.

Note: Students are in residence at the Barrier Lake Field Station during Spring Intersession for a substantial part of the course. A supplementary fee will be assessed to cover additional costs associated with this course. Students will require consent of the department to drop this course.

Neuroscience 401 **3 units; H(0-6)**

Advanced Neuroscience Laboratory
Advanced neurophysiological, behavioural, molecular biological, and histological techniques used to investigate nervous system function will be covered. The course is delivered in the form of hypothesis-driven research projects.

Prerequisite(s): Zoology 461 and admission to the Neuroscience program.

Neuroscience 411 **3 units; H(3-0)**

Cellular and Systems Neuroscience
Structure and function of the nervous system examined through neurochemistry, intracellular signal transduction, mechanisms of communication, and functional organization of the nervous system at the cellular and systems levels.

Prerequisite(s): Zoology 461 and admission to the Neuroscience program, or a minimum grade of "B+" in Zoology 461.

Note: This course is offered as part of an honours program.

Neuroscience 421 **3 units; H(3-0)**

Neuroscience: History, Ethics and Society
An exploration of topics in the history of neuroscience, aspects of ethics as they apply to studies of the brain and how neuroscience fits into society.

Prerequisite(s): 48 units (8.0 full-course equivalents) and admission to the major in Neuroscience, Biological Sciences, Health Science or Psychology.

Neuroscience 475 (Psychology 475) **3 units; H(3-0)**

Drugs and Behaviour
The behavioural effects of drugs specifically employed to affect the nervous system, as seen in the treatment of mental disorders, behavioural disorders, and other conditions such as Parkinson's, Huntington's and Alzheimer's diseases. Neuro-pharmacologic agents will be discussed as they relate to the biochemistry and physiology of putative neurotransmitters.

Prerequisite(s): Psychology 312, 375 and admission to the Neuroscience Program.

Neuroscience 478 (Psychology 478) **3 units; H(3-3)**

Behavioural Neuroscience
An examination of the neural underpinnings of behaviour. Experimental approaches, neural mechanisms, and health implications will be explored through both lecture material and laboratory exercises.

Prerequisite(s): Psychology 312, 375 and admission to the Neuroscience Program.

Neuroscience 479 (Psychology 479) **3 units; H(3-2)**

Human Neuropsychology
Integration of the literature on human brain damage with the evidence from animal research. Topics include developmental neuropsychology; cognitive deficits associated with frontal, parietooccipital, and temporal lobes; origins and mechanisms in the determination of cerebral dominancy; disorders of learning and memory; long-term effects of cerebral lesions.

Prerequisite(s): Psychology 312, 375 and admission to the Neuroscience program.

Neuroscience 500 **6 units; F(1-8)**

Honours Thesis in Neuroscience
Research project undertaking critical assessment of data collected testing and hypothesis derived from the literature. To be conducted under the direction of one or more faculty members from departments participating in the Neuroscience program. Formal written and oral reports must be presented on completion of the course.

Prerequisite(s): 75 units (12.5 full-course equivalents) and admission to the Neuroscience program.

Neuroscience 506 **6 units; F(0-6)**

Special Topics in Neuroscience
Lectures, seminars, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 60 units (10.0 full-course equivalents) and admission to the Neuroscience program.

MAY BE REPEATED FOR CREDIT

Neuroscience 507 **3 units; H(3-3)**

Special Topics in Neuroscience
Lectures, seminars, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 60 units (10.0 full-course equivalents) and admission to the Neuroscience program.

MAY BE REPEATED FOR CREDIT

Neuroscience 511 **3 units; H(2-1S)**

Neuroscience Seminar
Students will attend the weekly Hotchkiss Brain Institute seminars. Following each seminar, students will discuss the presentation under the tutelage of a moderator familiar with the field of enquiry.

Prerequisite(s): 75 units (12.5 full-course equivalents) and admission to the Neuroscience program.

Neuroscience 521 (Psychology 521) **3 units; H(3-0)**

Cognitive and Clinical Neuroscience
An examination of how the human central nervous system controls higher order, complex behaviours. Experimental and clinical evidence for the neurobiological regulation of memory, language, attention, perception and emotion will be evaluated.

Prerequisite(s): Psychology 312, 375 and admission to the Neuroscience program.

Neuroscience 531 (Psychology 531) **3 units; H(3-0)**

Nervous System Development
This course covers the fundamental principles of the development of nervous systems, integrating anatomical, cellular, molecular, genetic and behavioural approaches.

Prerequisite(s): Psychology 475 and admission to the Neuroscience program.

Neuroscience 541 **3 units; H(3-0)**

Model systems in Neurobiology
Enhanced understanding of the cellular and molecular foundations of information processing and process control in the nervous system by exploring the neural basis of natural behaviour of various invertebrate and vertebrate model systems.

Prerequisite(s): Zoology 461 and admission to the Neuroscience program.

Antirequisite(s): Credit for Neuroscience 541 and Zoology 595 will not be allowed.

Nursing NURS

Instruction offered by members of the Faculty of Nursing.

Courses are restricted to students admitted to the Faculty of Nursing.

Note: Where applicable, Clinical Practice courses must be taken concurrently with the theoretical components.

Junior Courses

Nursing 201 **3 units; H(3-0)**

Introduction to Nursing
Basic concepts of nursing, individual, family, community, health, environment, and the relationships among them. Historical development of the nursing profession, its unique position within the health care system, and the roles of various health care providers.

Corequisite(s): Nursing 203 and 205.

Nursing 203 **3 units; H(0-3)**

Foundations for Nursing Practice
Development of skills applicable to nursing practice.

Corequisite(s): Nursing 201 and 205.

Note: Students must obtain a grade of "C" or better to proceed with program.

Nursing 205 **3 units; H(3-0)**

Therapeutic Interventions
Nursing therapeutics and pharmacology in wellness and illness states across the lifespan.

Corequisite(s): Nursing 201 and 203.

Nursing 207 **3 units; H(3-0)**

Nursing Inquiry
Continuing development of a conceptual framework for nursing practice. Development of a theoretical base for understanding various human responses to health experiences.

Prerequisite(s): Nursing 201, 203 and 205.

Corequisite(s): Nursing 209 and 211.

Nursing 209 **3 units; H(104 hours)**

Nursing Practice
Continuing development of skills for nursing practice with opportunity to apply assessment, psychomotor and communication skills in the helping relationship.

Prerequisite(s): Nursing 201, 203 and 205 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 207 and 211.

NOT INCLUDED IN GPA

Nursing 211 **3 units; H(2-3)**

Health Assessment
Knowledge and basic skills needed to complete a health history and a holistic assessment of healthy individuals. Students will practice health assessment skills on each other.

Prerequisite(s): Nursing 201, 203 and 205, Zoology 269 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 207 and 209.

Note: Students must obtain a grade of "C" or better to proceed with program.

Nursing 213 **3 units; H(80 hours in Spring Intersession)**

Consolidation Practicum I
Integration of learning and continuing development of professional relationships with individuals and families experiencing health challenges in selected settings.

Prerequisite(s): Nursing 207, 209 and 211, Zoology 269 and current CPR Basic Cardiac Life Support.

NOT INCLUDED IN GPA

Nursing 221 **3 units; H(3-2)**

Human Anatomy and Physiology I
The use of lecture and laboratory approaches to introduce students to the study of the human body. It begins with introductory concepts related to terminology and basic chemical processes, then examines cellular physiology and tissues, and subsequently reviews the integumentary, skeletal, muscular, and nervous systems.

Prerequisite(s): Biology 30.

Antirequisite(s): Credit for Nursing 221 and Kinesiology 259 will not be allowed.

Note: The laboratory component of the course generally parallels and reinforces lecture concepts through the use of tutorials, models, histological slides and computer simulations. Open only to students in the Bachelor of Nursing Program offered by the Qatar Faculty.

Nursing 222 **3 units; H(3-2)**

Human Anatomy and Physiology II
A review of some of the important concepts from Human Anatomy and Physiology I and then examines the endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems. Physiological processes that contribute to body defences (the immune system) as well as metabolism and temperature regulation are also covered.

Prerequisite(s): Nursing 221.

Antirequisite(s): Credit for Nursing 222 and Kinesiology 260 will not be allowed.

Note: The laboratory component of the course generally parallels and reinforces lecture concepts through the use of tutorials, models, histological slides and computer simulations. Open only to students in the Bachelor of Nursing Program offered by the Qatar Faculty.

Nursing 285 **3 units; H(3-0)**

The Discipline and Profession of Nursing I: Foundational Professional Concepts
The study of concepts foundational to the profession and discipline of nursing. Exploration of concepts of complexity, transition, social justice, ethic of caring, health promotion and principles of population health. Emphasis on understanding the social commitments and contributions made by nursing within its professional scope of practice. Includes an overview of the Canadian health care system.

Corequisite(s): Nursing 287, 288 and 289.

Nursing 287 **3 units; H(3-0)**

The Science of Health I: Communities and Populations
Determinants of health, health indices, principles and methods of epidemiology, and population-based health management are emphasized. Conduct of health surveys and use of population-based health data to identify health risk are addressed. Integration of concepts of microbiology and risk elevation related to ages and stages of the

lifespan. Basic tenets of the meaning of evidence-based practice will be introduced.

Corequisite(s): Nursing 285, 288 and 289.

Nursing 288 **3 units; H(3-0)**

Supporting Health I: Communities and Populations
Focus on a broad understanding of health and the basic frameworks and principles of population health promotion, primary health care and upstream thinking. Explores how health can be created and supported in a society. Emphasis on developing communication and relationship building skills to work effectively in a group or a team. Strategies to assess protect and promote the health of groups and communities.

Corequisite(s): Nursing 285, 287 and 289.

Nursing 289 **6 units; F(247 hours)**

Integrating Nursing Roles & Practices I: Learning, Praxis and Scholarship in the Practicum Setting
Integration and application of theoretic knowledge in simulated and nursing practice settings. Develop skills and competencies in nursing of groups, communities, and populations within a collaborative practice model.

Prerequisite(s): Current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 285, 287 and 288.

NOT INCLUDED IN GPA

Senior Courses

Nursing 301 **3 units; H(3-0)**

Adult Health Theory
Focus on expanding the theoretical understanding of the adult experiencing complex acute and chronic illness.

Prerequisite(s): Nursing 213 (BNRT students only).

Corequisite(s): Prerequisite or Corequisite: Nursing 311. Corequisite: Nursing 302.

Nursing 302 **6 units; F(208 hours within one term)**

Adult Health Practice
Managing care from a holistic and interdisciplinary perspective for more acutely and chronically ill patients with a primary focus on the adult in acute medical/surgical settings.

Prerequisite(s): Nursing 213 (BNRT students only) and current CPR Basic Cardiac Life Support.

Corequisite(s): Prerequisite or Corequisite: Nursing 311. Corequisite: Nursing 301.

NOT INCLUDED IN GPA

Nursing 303 **3 units; H(3-0)**

Psychiatric/Mental Health Theory
Exploration of concepts related to individuals and families experiencing mental health and illness.

Prerequisite(s): Nursing 213 (BNRT students only).

Corequisite(s): Nursing 305.

Nursing 305 **3 units; H(128 hours within one term)**

Psychiatric/Mental Health Practice
Application of concepts, values, and skills with individuals, groups, and families experiencing mental health and illness.

Prerequisite(s): Nursing 213 (BNRT students only) and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 303.

NOT INCLUDED IN GPA

Nursing 307 **3 units; H(3-0)**

Nursing of Families
Exploration of family nursing theory, models, and relational nursing practices which involve and support families within a variety of nursing practice contexts.

Prerequisite(s): Nursing 213 (BNRT students only).

Nursing 309 **3 units; H(3-0)**

Nursing Research
Overview of research methodologies with emphasis on the critique of research and its use in nursing practice.

Note: Completion of a statistics course is strongly recommended prior to taking Nursing 309.

Nursing 311 **3 units; H(3-0)**

Pathophysiology
An overview of human pathophysiological concepts at the cellular, organ and systems level.

Prerequisite(s): Zoology 269.

Nursing 385 **3 units; H(3-0)**

The Discipline and Profession of Nursing II: Inter-Professional Practice and Professional Accountability
Concepts of inter-professional practice and its core competencies are introduced. Examination of the contributions of nursing and nursing sensitive outcomes. Full scope nursing roles on intraprofessional and interprofessional teams are explored, in particular as pertains to the complex health care needs of families in transition and at risk. Of primary focus is exploration of the scholarly and research foundations of the profession as the basis of the professional role of a Registered Nurse.

Prerequisite(s): Nursing 285, 287, 288 and 289.

Corequisite(s): Nursing 387, 388 and 389.

Nursing 387 **3 units; H(3-0)**

The Science of Health II: Families in Transition
Holistic models addressing bio/psycho/social/spiritual/cultural dimensions of family health processes are addressed. Focus on the epidemiological, physiological, pathology, and mental health knowledge that underlies the assessments of key family transitional periods. Young and senior families are highlighted.

Prerequisite(s): Nursing 285, 287, 288 and 289.

Corequisite(s): Nursing 385, 388, and 389.

Nursing 388 **3 units; H(3-0)**

Supporting Health II: Families in Transition
Focus on how health, inclusive of mental health and wellness, is created and supported in families. The study of how health can be enhanced or compromised in important transition periods across the lifespan - from young to senior families. Examination of the manner in which nursing practice and health education serve to enhance family health.

Prerequisite(s): Nursing 285, 287, 288 and 289.

Corequisite(s): Nursing 385, 387 and 389.

Nursing 389 **6 units; F(247 hours)**

Integrating Nursing Roles and Practices II: Learning, Praxis and Scholarship in the Practicum Setting
Integration and application of theoretic knowledge in simulated and nursing practice settings. Develop skills and competencies in nursing families in transitional periods across the lifespan. Focus on optimizing family health and functioning while mitigating health risks to family members.

Prerequisite(s): Nursing 285, 287, 288 and 289 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 385, 387, and 388.

NOT INCLUDED IN GPA

Nursing 401 **3 units; H(3-0)**

Community Health Theory
Exploration of concepts related to the focus of the community as a client. Public health, populations at risk for physical and psychosocial disruptions in health, environmental health, cultural health patterns and beliefs, group dynamics and communications with groups.

Prerequisite(s): Nursing 213 (BNRT students only).

Corequisite(s): Nursing 402.

Nursing 402 **6 units; F(208 hours)**

Community Health Practice
Application of concepts, values, and skills with the community as the focus of care. Experiences are drawn from a variety of rural and urban settings.

Prerequisite(s): Nursing 213 (BNRT students only) and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 401.

NOT INCLUDED IN GPA

Nursing 403 **3 units; H(5-0)**

Childbearing/Childrearing Families - Theory
Maternity and child health with family as context; the role of nursing pertinent to wellness patterns and alterations in health in these populations.

Prerequisite(s): Nursing 213 (BNRT students only) and 311.

Corequisite(s): Nursing 404.

Nursing 404 **6 units; F(208 hours within one term)**

Childbearing/Childrearing Families - Practice
Facilitating and assisting childbearing and childrearing families to identify and respond to needs related to health promotion, health maintenance, and illness intervention in a variety of nursing practice settings.

Prerequisite(s): Nursing 213 (BNRT students only), 311 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 403.

NOT INCLUDED IN GPA

Nursing 405 **3 units; H(3-0)**

Issues in Professional Practice
The nursing role related to the dynamics of the nursing profession and the health care system; nursing and contemporary health issues.

Prerequisite(s): Nursing 301, 302, 303 and 305.

Nursing 406 **6 units; F(160 hours within one term)**

Consolidation Practicum II
Consolidation experience which includes theory and practice opportunities, and prepares students for the final year and selected area of focus.

Prerequisite(s): All Nursing courses with the exception of Nursing 307, 309 or 405 and senior Nursing options, and current CPR Basic Cardiac Life Support.

NOT INCLUDED IN GPA

Nursing 411 **3 units; H(3-0)**

Nursing Scholarship
An inquiry-based approach to issues and trends in nursing scholarship.

Nursing 421 **3 units; H(3-0)**

Nursing of Families
Nursing of families in a variety of settings and clinical populations.

Nursing 441 **3 units; H(3-3)**

Health Assessment
Assessment of individuals in health and illness including health history and physical examination. Students will be expected to practice assessment skills in a clinical/laboratory setting.

Prerequisite(s): A course in human anatomy and physiology, and current CPR Basic Rescuer Certificate.

Note: Students must obtain a grade of "C" or better to proceed with program.

Nursing 461 **3 units; H(4-0)**

Pathophysiology
Selected pathophysiological concepts and their relationship to human systems with an opportunity to explore an area of pathophysiology in depth.

Prerequisite(s): A course in human anatomy and physiology.

Nursing 485 **3 units; H(3-0)**

The Discipline and Profession of Nursing III: Furthering Inquiry and Scholarship in Nursing
Focus on strategies for the development of evidence-informed nursing practice. Examination of strategies to critique and facilitate the use of evidence for practice. Introduction to basic quantitative and qualitative methods used in nursing research.

Prerequisite(s): Nursing 385, 387, 388, 389.

Corequisite(s): Nursing 487, 488 and 489.

Nursing 487 **3 units; H(3-0)**

The Science of Health III: People Experiencing Life-Threatening Health Challenges
Theoretic understanding of the holistic experience of acuity and life-threat for individuals and families is presented. Epidemiology, pathophysiology, diagnostic studies, complex physical and other nursing assessments relevant to common life-threatening health challenges, including mental health disorders.

Prerequisite(s): Nursing 385, 387, 388 and 389.

Corequisite(s): Nursing 485, 488, and 489.

Nursing 488 **3 units; H(3-0)**

Supporting Health III: People with Life-Threatening Health Challenges
Addresses nursing practices in acute unstable illness, injury and disease. The study of application of nursing assessments, technological interventions and best evidence nursing practices in common major acute illnesses in individuals of all age groups, set within the context of their families and communities. Emphasis is on attaining knowledge of secondary and tertiary prevention strategies. Pharmacological applications to major acute disease conditions.

Prerequisite(s): Nursing 385, 387, 388, 389.

Corequisite(s): Nursing 485, 487 and 489.

Nursing 489 **6 units; F(247 hours)**

Integrating Nursing Roles and Practices III: Learning, Praxis and Scholarship in the Practicum Setting
Integration and application of theoretic knowledge in simulated and nursing practice settings. The focus in this course is nursing care of clients and families experiencing life-threatening health challenges. Development of skills of complex communication and relationship building, high-level assessment and clinical reasoning, and nursing care planning and implementation.

Prerequisite(s): Nursing 385, 387, 388, 389 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 485, 487, and 488.

NOT INCLUDED IN GPA

Nursing 495 **3 units; H(3-0)**

The Discipline and Profession of Nursing IV: Understanding the Challenges of Leadership and Systems of Care
This course explores knowledge related to the current health care system, systems of care responsive to the needs of clients with chronic health disruptions, and nursing roles of leadership and delegation. Evidence examining the efficacy of systems of care and the efficacy of nursing roles, practices, and contributions are highlighted. Examination of selected approaches to nursing research.

Prerequisite(s): Nursing 485, 487, 488 and 489.

Corequisite(s): Nursing 497, 498 and 499.

Nursing 497 **3 units; H(3-0)**

The Science of Health IV: People Experiencing Chronic Health Challenges
Experience of living with chronic health challenges, including common complications. Epidemiology, pathophysiology, diagnostic studies, complex physical and other nursing assessments relevant to common chronic health challenges, including mental health disorders. A holistic perspective is taken to examine the challenges of ongoing health management faced by populations of chronically ill individuals and their families.

Prerequisite(s): Nursing 485, 487, 488 and 489.

Corequisite(s): Nursing 495, 498, and 499.

Nursing 498 **3 units; H(3-0)**

Supporting Health IV: People With Chronic Health Challenges
Nursing practices in caring for the chronically ill. A focus on practices to achieve healthful transitions and preservation of quality of life are emphasized. Common treatment modalities are presented including nursing therapeutics and pharmacological approaches to management of common chronic diseases. Tertiary prevention is emphasized and concepts and approaches to ongoing health assessment, health education, self-management, harm reduction, support, restoration, and palliation are addressed.

Prerequisite(s): Nursing 485, 487, 488 and 489.

Corequisite(s): Nursing 495, 497 and 499.

Nursing 499 **6 units; F(247 hours)**

Integrating Nursing Roles and Practices IV: Learning, Praxis and Scholarship in the Practicum Setting
Integration and application of theoretic knowledge in simulated and nursing practice settings. Long-term nursing care of individuals, families and populations with chronic health challenges. Implementation of effective therapeutic relationships, complex assessments, reasoned clinical decision-making, client and family health education, client self-management and collaborative practice models.

Prerequisite(s): Nursing 485, 487, 488 and 489 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 495, 497 and 498.

NOT INCLUDED IN GPA

Nursing 501 **3 units; H(3-0)**

Advanced Concepts in Nursing Practice
Leadership, management and change within the context of nursing and health care. Exploration of strategies for transition to the graduate role and responsibilities inherent in being a nursing professional.

Prerequisite(s): Nursing 301, 302, 303, 305, 401, 402, 403 and 404.

Nursing 502 **6 units; F(328 hours within one term)**

Senior Clinical Practicum
Synthesis, application and further acquisition of knowledge, skills, and attitudes in a selected nursing practice setting. Emphasis on complexity of nursing care with clients (individuals, families and/or aggregates). Selection of focus area will be made through consultation with faculty.

Prerequisite(s): Nursing 406 (BNRT students only) and current CPR Basic Cardiac Life Support.

Corequisite(s): Prerequisite or Corequisite: Nursing 501.

NOT INCLUDED IN GPA

Nursing 503 **3 units; H(3-0)**

Selected Topics in Nursing
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 511 **3 units; H(3-0)**

Introduction to the Use of Music and Sound for the Helping Professions
Survey of recently developed applications of music and sound to integrative health care including traditional music therapy, voice therapy, sonic entrainment, and cross-cultural traditions in the use of music and sound for holistic care.

Prerequisite(s): Consent of the Faculty.

Nursing 517 **3 units; H(3-0)**

Philosophy and Practice in Palliative Care
Examination of the philosophy of palliative/hospice care, taught by faculty from many disciplines. An important focus includes the students' self-exploration of their own beliefs, values, and attitudes about life, illness, death, and dying, and how this self-exploration shapes interactions with those we care for.

Prerequisite(s): Consent of the Faculty.

Nursing 531 **3 units; H(3-2)**

Community Health Nursing Theory
Concepts and models related to population-focused nursing with emphasis on community, health promotion, team building, assessment strategies, and planning approaches.

Nursing 533 **3 units; H(128 hours within one term)**

Community Health Nursing Clinical Practice
Application and synthesis of concepts and models related to population-focused nursing.

Prerequisite(s): Nursing 531, current CPR Basic Cardiac Life Support, and proof of current, active nurse registration.

Antirequisite(s): Credit for Nursing 533 and 532 will not be allowed.

NOT INCLUDED IN GPA

Nursing 537 **3 units; H(3-0)**

Nursing Leadership and Management
Professional and interpersonal relationships in nursing practice with an emphasis on leadership, interdisciplinary collaboration, and the management of nursing care at macro and micro levels.

Nursing 539 **3 units; H(3-0)**

Research in Nursing
Concepts and process necessary for critiquing research and application to nursing practice.

Note: Completion of a statistics course is strongly recommended prior to taking Nursing 539.

Nursing 543 **3 units; H(128 hours within one term)**

Senior Practicum
Synthesis and application of theoretical concepts within a selected area of practice with emphasis on further development of self-directed skills and professional attitudes.

Prerequisite(s): Nursing 441 and 533, current CPR Basic Cardiac Life Support, and proof of current, active nurse registration.

Antirequisite(s): Credit for Nursing 543 and 542 will not be allowed.

NOT INCLUDED IN GPA

Nursing 585 **3 units; H(3-0)**

The Discipline and Profession of Nursing V: Preparing for Professional Role Transition
This course focuses on the integration of senior students into the environment of professional nursing practice with an evidence-informed emphasis on the essentials of leadership, relational and practice ethics, effective inter and intra-professional collaboration, communication and conflict management for the purpose of facilitating a healthy transition to the role of a new graduate professional nurse within a contemporary health care climate.

Prerequisite(s): Nursing 495, 497, 498, 499.

Corequisite(s): Nursing 589 and two Senior Nursing Option courses.

Nursing 589 **6 units; F(247 hours)**

Integrating Nursing Roles and Practices V: Learning, Praxis and Scholarship in the Practicum Setting
This focused clinical experience, supported by two corequisite substantive nursing option theory courses, is aimed at refining critical thinking and competent use of theoretic frameworks and evidence to support clinical reasoning processes including: comprehensive assessment, holistic analysis and interpretation of client data, and competence and confidence in clinical decision-making. Students will choose a focused area of nursing practice.

Prerequisite(s): Nursing 495, 497, 498, 499 and current CPR Basic Cardiac Life Support.

Corequisite(s): Nursing 585 and two Senior Nursing Option courses.

NOT INCLUDED IN GPA

Nursing 599 **15 units (2.5 full-course equivalents) (378 clinical hours)**

Integrating Nursing Roles and Practices VI: Transition to Nursing Practice
Synthesis, application and further acquisition of knowledge, skills, and attitudes in a selected nursing practice setting. Emphasis on complexity of nursing care with clients (individuals, families, and/or aggregates). Selection of focus area will be made through consultation with faculty.

Prerequisite(s): Nursing 585 and 589, two Senior Nursing Option courses and current CPR Basic Cardiac Life Support.

NOT INCLUDED IN GPA

Graduate Courses

Nursing 601 **3 units; H(3S-0)**

Seminar on Special Topics Related to Health Care and Nursing
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 603 **3 units; H(156 hours)**

Independent Supervised Clinical Practicum
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 605 **3 units; H(3S-0)**

Philosophical Knowledge and Advanced Nursing Practice
Exploration of the philosophical knowledge of advanced nursing practice. A process of critical analysis, reflection and inquiry into the various philosophical approaches, ways of knowing, theories concepts and paradigms leading to a philosophically informed analysis of the knowledge practices activated during the conduct of nursing work.

Prerequisite(s): Consent of the Faculty.

Nursing 607 **3 units; H(39 hours)**

Independent Guided Study
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 609 **3 units; H(3-1)**

Applied Statistics for Nursing Research
The understanding of the conceptual basis, use, and pitfalls of common bio statistical methods used in the analyses of data, as well as, being able to analyze data using computer software. This course minimizes mathematical theory and concentrates on the 'when to use', 'why to use', and 'what the results mean' bio statistical issues.

Prerequisite(s): Consent of the Faculty.

Nursing 611 **3 units; H(3-0)**

Theoretical Knowledge and Advanced Nursing Practice
Introduction to substantive theory related to advanced nursing practice. As students identify their population focus they will examine frameworks for advanced nursing practice that inform their care for individuals, families and communities of practice.

Prerequisite(s): Consent of the Faculty.

Nursing 617 **3 units; H(3-0)**

Philosophy and Practice in Palliative Care
Examination of the philosophy of palliative/hospice care, taught by faculty from many disciplines. An important focus includes the students' self-exploration of their own beliefs, values, and attitudes about life, illness, death, and dying, and how this self-exploration shapes interactions with those we care for.

Prerequisite(s): Consent of the Faculty.

Nursing 621 **3 units; H(3S-0)**

Quantitative Designs and Analysis
Critical analysis of nursing research. Emphasis on the study of research designs appropriate to clinical nursing problems, measurement, reliability and validity issues, and critique criteria.

Prerequisite(s): Consent of the Faculty.

Nursing 623 **3 units; H(3-0)**
(formerly Nursing 601.23)

Hermeneutic Phenomenology
Inquiry into the philosophical and historical influences that have shaped hermeneutic phenomenology as an approach to nursing and health care research. Exploration of interpretive practices essential to the conduct of hermeneutic research.

Prerequisite(s): Consent of the Faculty.

Nursing 627 **1.5 units; Q(18 hours)**

Academic Scholarly Writing
An intensive two-day writing workshop with additional pre-course reading and writing. Students will prepare for the course by reading texts and writing scholarly accounts that may be based in their nursing practice.

Prerequisite(s): Consent of the Faculty.

Nursing 629 **1.5 units; Q(18 hours)**

Evidence-Informed Nursing
Building on foundations of critical inquiry by emphasizing the evaluation and interpretation of qualitative and quantitative research, students develop an enhanced ability to use systematic reviews and research-based innovations in making evidence-based decisions for client care, nursing knowledge and organizational or system improvement.

Prerequisite(s): Consent of the Faculty.

Nursing 633 **3 units; H(3S-8)**

Leadership in Advanced Nursing Practice and Practicum I
A critical examination of theories and principles of leadership and leadership development as it relates to individual leadership practices, leading multidisciplinary teams, and leadership within the broader health system. Students will explore and discuss the influence of leaders and leadership on the health care workplace, on client/population outcomes, and the health care system. In the practicum project students will utilize evidence to assess their leadership skills and competencies, and how they relate to the development and evaluation of their practicum project.

Prerequisite(s): Nursing 605 and 611.

Nursing 634 **6 units; F(2S-8)**

Advanced Nursing Practice: Practicums II and III
The purpose of clinical practicums II and III is to follow through with the project that was proposed

in Nursing 633 including: implementing the study, analysing and interpreting the findings, writing and submitting the paper for publication and/ or presenting the paper at a conference.

Prerequisite(s): Nursing 633.

Nursing 642 **6 units; F(52S-180 within 8-week block)**

Nurse Practitioner Practicum I and Role Integration
Building on the foundational knowledge of advanced pathophysiology, advanced health assessment and pharmacology, this course provides an opportunity for students to begin to acquire advanced knowledge and skills related to clinical diagnosis, decision-making and management of commonly presented acute and chronic health problems. Additionally this course will address issues related to nurse practitioner role integration.

Prerequisite(s): Nursing 661, 663 and 665 or consent of the Faculty, registration in Post-Master's NP Diploma program or the integrated MN/NP program.

NOT INCLUDED IN GPA

Nursing 644 **6 units; F(52S-180 within 8-week block)**

Nurse Practitioner Practicum II
Diagnostic and management skills related to care of patients. Further development of skills in clinical history taking, physical assessment, and diagnostic testing.

Prerequisite(s): Nursing 642.

NOT INCLUDED IN GPA

Nursing 646 **6 units; F(52S-180 within 8-week block)**

Nurse Practitioner Practicum III
Learning opportunities and practice experience with emphasis on clinical diagnosis, diagnostic imaging, laboratory tests, differential diagnosis, and patient management.

Prerequisite(s): Nursing 644.

NOT INCLUDED IN GPA

Nursing 650 **6 units; F(16S-292 within 8-week block)**

Nurse Practitioner Practicum IV
Consolidation of components of NP role in specialty focus.

Prerequisite(s): Nursing 646.

Note:

NOT INCLUDED IN GPA

Nursing 661 **3 units; H(4S-0)**

Advanced Pathophysiology and Therapeutics
Study of pathophysiological phenomena and therapeutics at an advanced level. Classes will be a combination of didactic presentations, seminars and case studies. Students are invited to explore morbidity and mortality in the Canadian population in general and in their area of focus in particular.

Prerequisite(s): Consent of the Faculty.

Nursing 663 **3 units; H(3S-0)**

Pharmacotherapeutics in Advanced Nursing Practice
Principles of drug action, pharmacokinetics and pharmacotherapeutics in the context of advanced nursing practice. Opportunity to investigate pharmacotherapies specific to student's individual client populations.

Prerequisite(s): Consent of the Faculty.

Nursing 665 **3 units; H(3S-3)**

Advanced Health Assessment
Builds upon fundamental health assessment skills to provide a solid foundation for advanced assessment. Focuses on history taking physical examination, diagnostic reasoning and clinical judgment, as well as selected diagnostic skills necessary for advanced practice.

Prerequisite(s): Consent of the Faculty.

Nursing 683 **3 units; H(3S-0)**

Qualitative Designs and Analysis
Exploration of research methods based primarily on inductive reasoning. Methods, issues and techniques of sampling, data collection, analysis, and interpretation will be explored. Experience will be provided in data collection, management, and analysis.

Prerequisite(s): Consent of the Faculty.

Nursing 701 **3 units; H(3-0)**

Doctoral Special Topics
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 705 **3 units; H(3-0)**

Philosophy of Science in Nursing
Exploration of major philosophical positions and their contributions to the generation and evaluation of knowledge. Examination of the development and evolution of nursing knowledge.

Prerequisite(s): Consent of the Faculty.

Nursing 707 **3 units; H(39 hours)**

Directed Study
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 711 **3 units; H(2S-0)**

Doctoral Scholarship in Nursing
Focus on development of a nurse scientist. Seminar discussions will address launching a viable and fundable program of research, grantsmanship, managing multi-disciplinary research teams, and establishing a record of publication and dissemination.

Prerequisite(s): Consent of the Faculty.

NOT INCLUDED IN GPA

Nursing 721 **3 units; H(3-0)**

Advanced Quantitative Research Methods
Opportunities for developing nurse scientists and other health professional doctoral students to increase understanding of, and ability to utilize, quantitative research methods for scientific inquiry. Focuses on identifying issues/dilemmas arising during the research process and methods to address these challenges.

Prerequisite(s): Nursing 621 or equivalent.

Nursing 723 **3 units; H(3-0)**

Hermeneutic Phenomenology
Inquiry into the philosophical and historical influences that have shaped hermeneutic phenomenology as an approach to nursing and health care research. Exploration of interpretive practices essential to the conduct of hermeneutic research.

Nursing 733 **3 units; H(2S-0)**

Doctoral Thesis Seminar
Opportunity for students to discuss development of their thesis proposal with a focus on the question, design, ethical considerations, and funding.

Prerequisite(s): Nursing 705 and one graduate level advanced research course.

NOT INCLUDED IN GPA

Nursing 769 **3 units; H(3-0)**

Contemporary Issues in Health Care
Theoretical examination of concepts and research for increasing the availability and accessibility of health care. Appraisal of the relationships among leadership, policy and practice issues from a multidisciplinary perspective.

Prerequisite(s): Consent of the Faculty.

Nursing 783 **3 units; H(3-0)**

Advanced Qualitative Research Methods
Exploration of the philosophical foundations and practice of qualitative research methods in health care inquiry. Emphasis on interpretive assumptions and practices relevant to the conduct of qualitative research.

Prerequisite(s): Nursing 683 or equivalent.

Operations Management OPMA

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Operations Management 301 **3 units; H(3-0)**

Introduction to Production and Operations Management
A survey of the decision processes in production and operations management and their relationship to other business functions. Topics include project planning and scheduling, inventory management, materials requirements planning, quality management, capacity planning, facilities layout, and supply chain management.

Prerequisite(s): Any 200-level Mathematics or Statistics 213 (or equivalent, excluding Statistics 201), and Entrepreneurship and Innovation 201.

Antirequisite(s): Credit for Operations Management 301 and 317 will not be allowed.

Note: Not available for credit toward the Bachelor of Commerce degree. Preference in enrolment is given to students who have declared a Management and Society Minor.

Operations Management 317 **3 units; H(3-0)**

Fundamentals of Operations Management
Introduction to the wide applicability, broad scope, strategic importance and major decisions of operations management, as well as important interactions with other functional areas. Topics covered include the design, control and improvement/innovation of business and other processes, project planning and control, quality management, statistical quality control, inventory management, just-in-time systems, and supply chains.

Prerequisite(s): Admission to the Haskayne School of Business, Business and Environment 291 or Management Studies 217, and Statistics 213.

Antirequisite(s): Credit for Operations Management 317 and 301 will not be allowed.

Operations Management 401 3 units; H(3-0)

Materials and Supply Chain Management
An in-depth treatment of inventory and replenishment management. Topics covered include manufacturing planning and control, order point inventory control, demand management, sales and operations planning, master production scheduling, materials requirements planning, just-in-time and strategic supply chain management. Case studies and a site visit may be used, as well as illustrations of spreadsheet modelling.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

Operations Management 403 3 units; H(3-0)

Managing Quality in Products and Services
An in-depth treatment of quality management practices and techniques for products and services. Topics and techniques covered include designing and assuring quality, quality issues in the supply chain, statistical quality measurement, and continuous process and quality improvement.

Prerequisite(s): Admission to the Haskayne School of Business and Operations Management 317.

Operations Management 405 3 units; H(3-0)

Service Operations Management
The management of service businesses from both a qualitative and quantitative perspective. Topics may include service design and performance measurement, service quality and recovery, managing people in service industries, service demand forecasting, scheduling, managing lineups, yield management, network optimization, and the role of information technology. Industry examples include travel and hospitality, professional services, retail, communication and transportation and banking.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

Operations Management 407 3 units; H(3-0)

Project Management
The management of projects in a variety of settings such as software development and installation, disaster relief, new product development, advertising campaigns and financial auditing are examined. Material from the organizational, planning, technical, financial, informational, and logistical aspects of project management will emphasize the interdisciplinary nature of projects. Students learn the use of commercial computer software for planning and scheduling projects.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

Operations Management 409 3 units; H(3-0)

Computer Simulation for Business
Companies encounter numerous problems that are characterized by uncertainties for which they need to find a solution. Simulation provides a means for imitating the behavior of real-life situations in a computer environment, allowing for `what-if' analyses of different scenarios. Students will gain hands-on experience in creating simulation models and obtaining reliable results for decision making with the use of different simulation techniques.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

Operations Management 411 3 units; H(3-0)

Field Investigation in Operations Management
Field investigation concerned with improvements in operations in an off-campus organization. The students work in teams on a single project. Both oral and written reports are required.

Prerequisite(s): Admission to the Haskayne School of Business, and 60 units (10.0 full-course equivalents) including Operations Management 317, Management Studies 391 and two 400-level Operations Management courses.

Operations Management 413 3 units; H(3-0)

Advanced Spreadsheet Modelling using VBA: Business Applications
Spreadsheet Modelling using advanced automation tools provided through Visual Basic for Applications (VBA). Advanced quantitative modelling will be combined with introductory programming and application development to provide decision support systems applied to the fields of operations management, finance and marketing.

Prerequisite(s): Admission to the Haskayne School of Business, Management Studies 391 and Operations Management 317.

Operations Management 415 3 units; H(3-0)

Business Analysis Using Spreadsheets
Modelling and analysis of quantitative business problems in spreadsheets. Use of optimization, simulation and other techniques, with application to various business fields. Case studies are used to develop skill in dealing with incomplete and ambiguous information. Emphasis is on insight for decision making.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

Operations Management 417 3 units; H(3-0)

Procurement Management for Supply Chains
An in-depth analysis of strategic procurement practices for competitive advantage, cost management, contractual negotiations and supplier management. Topics include: strategic implications of supply processes, valued supply organizations, common control systems, cost management, insourcing versus outsourcing, negotiation and supplier relations, just-in-time systems, risk and new developing responsibilities of the supply chain.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

Antirequisite(s): Credit for Operations Management 417 and 559.03 will not be allowed.

Operations Management 559 3 units; H(3-0)

Selected Topics in Operations Management
Investigation of selected topics in Operations Management.

Prerequisite(s): Admission to the Haskayne School of Business, Operations Management 317 and Management Studies 391.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Operations Management 601 3 units; H(3-0)

Operations Management
Management of the production and/or service delivery system of the organization in concert with marketing, human resources, finance, and information systems. Management decision making on a continuum from day-to-day operating decisions such as quality control to long-term strategic decisions such as capacity planning. Topics covered in the course may include operations strategy, project management and inventory and supply chain management.

Operations Management 715 3 units; H(3-0)

Management Science Using Spreadsheets
The modelling and analysis of quantitative problems from a variety of fields within business, with emphasis on insight for decision making. Use of optimization, simulation, decision analysis, and other techniques in spreadsheets. Spreadsheet engineering as an approach to reducing spreadsheet errors. Case studies are used to develop skill in dealing with incomplete and ambiguous information.

Prerequisite(s): Management Studies 613.

Operations Management 719 3 units; H(3-0)

Project Procurement and Logistics
Project procurement and logistics management in engineering, construction management and manufacturing, both nationally and internationally. Topics include fundamentals of procurement management, preparation of request for proposals, the selection of bidders, the evaluation of bids, supplier selection, contract management, control of inventory, handling of material flow and management of warehousing, logistics strategy and global issues.

Prerequisite(s): Business and Environment 691.

Operations Management 743 3 units; H(3-0)

Simulation of Operational Systems
Computer simulation as a decision-making methodology for all areas of organizations. Topics include model development and validation, design of simulation experiments, generation of appropriate values of random variables, interactive procedures and interpretation of results. A user-oriented language is utilized and an applied project is carried out.

Prerequisite(s): Operations Management 601 and Management Studies 613.

Operations Management 745 3 units; H(3-0)

Operations Planning and Supply Chain Management
An in-depth treatment of inventory management and operations planning as related to supply chain management. Topics treated include commonly used inventory control systems, various extensions of the basic economic order quantity model, aggregate planning, materials requirement planning, production scheduling, just-in-time manufacturing, and managing materials along the supply chain. Case studies will be used as well as illustrations of spreadsheet modelling.

Prerequisite(s): Operations Management 601 and Management Studies 613.

Operations Management 797 3 units; H(3S-0)

Advanced Seminar in Operations Management
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Operations Management 799 3 units; H(3S-0)

Doctoral Seminars in Operations Management
799.01. Strategic Research Issues

799.02. Tactical Research Issues

799.03. Operational Research Issues

Petroleum Engineering ENPE

Instruction offered by members of the Department of Chemical and Petroleum Engineering and the Department of Mechanical and Manufacturing Engineering in the Schulich School of Engineering.

Senior Courses

Petroleum Engineering 313 3 units; H(3-1T-2/2)

Introduction to Flow in Porous Media

Fluid flow in porous media: pore structure; porosity and absolute permeability capillarity; Darcy's Law and single phase flow; immiscible and miscible fluid flow; wettability; multiphase flow and relative permeability; pore level analysis of two-phase displacement; and integration of these properties with geological information; application of fundamental principles to hydrocarbon recovery from petroleum reservoirs.

Corequisite(s): Chemical Engineering 331 and admission to the Oil & Gas or Chemical Engineering with Petroleum Minor program.

Antirequisite(s): Credit for Petroleum Engineering 313 and Petroleum Engineering 513 will not be allowed.

Petroleum Engineering 423 3 units; H(3-1)

Oil and Gas Engineering Process Development

Design of oil and gas processing units and plants; cost estimates and oil and gas process economics; optimization techniques; introduction to linear programming; safety and environmental considerations in process design.

Prerequisite(s): Chemical Engineering 315 and admission to the Oil and Gas Engineering program.

Antirequisite(s): Credit for Petroleum Engineering 423 and Chemical Engineering 423 will not be allowed.

Petroleum Engineering 429 3 units; H(3-1)

Reservoir Engineering

Review of petroleum fluid properties and flow in porous media; reserve estimation using volumetric and material balance methods in gas, gas-condensate and oil reservoirs; discussion of reservoir drive mechanisms; aquifer models; decline analysis; routine and special core analysis; PVT data and equation of state modelling; single phase flow in reservoirs; introduction to well testing; introduction to reservoir modelling; introduction to reservoir recovery processes.

Prerequisite(s): Engineering 311, Petroleum Engineering 313 and Geology 377 and admission to the Oil & Gas or Chemical Engineering with Petroleum Minor program.

Antirequisite(s): Credit for Petroleum Engineering 429 and 523 will not be allowed.

Petroleum Engineering 505 3 units; H(3-1)

Surface Production Operations

Oil and gas treating process equipment, design and operation. Two-phase and three-phase separators; heater treaters. Fluid gathering and distribution systems. Pumps and compressors. Flow measurement and production testing. Natural gas dehydration and sweetening. Produced water treatment and disposal.

Prerequisite(s): Chemical Engineering 427.

Petroleum Engineering 507 3 units; H(3-1)

Well Logging and Formation Evaluation

Fundamentals of wireline well logging and the log interpretation techniques for oil and gas wells. Basic reservoir petrophysical parameters. Types of well logging devices; physics of operation and response characteristics of various well logging tools. Application of well logs for integrated petroleum reservoir management.

Prerequisite(s): Third-year standing, or higher, in Chemical Engineering or Oil & Gas Engineering.

Petroleum Engineering 509 3 units; H(3-1)

Well Testing

Basic theory and current techniques for well testing. Drawdown and build up tests; diffusivity equation and various boundary conditions and flow regimes; superposition; single-rate and multi-rate testing; effect of boundaries; derivative analysis; fractured wells, fractured reservoirs and other flow models; wellbore dynamics; type curve matching; advanced decline curve analysis. Computer aided analysis and hands on experience in the computer laboratory.

Prerequisite(s): Petroleum Engineering 429 or 523.

Petroleum Engineering 511 3 units; H(3-4)

Design for Oil and Gas Engineering I

Team design project applying principles of project engineering and management to the recovery and processing of hydrocarbons. Petroleum design considerations will include; detailed reservoir characterization; well test analysis; recovery and production forecasting; preliminary drilling, completions and facilities design, and economic evaluation.

Prerequisite(s): Chemical Engineering 315, 427; Chemical Engineering 423 or Petroleum Engineering 423; Petroleum Engineering 429 or 523 and admission to the Oil & Gas or Chemical Engineering with Petroleum Minor program.

Antirequisite(s): Credit for Petroleum Engineering 511 and Chemical Engineering 511 will not be allowed.

Petroleum Engineering 513 3 units; H(3-1)

Flow in Porous Media

Fundamentals of fluid flow in porous media: pore structure; porosity and absolute permeability capillarity; Darcy's Law and single phase flow; immiscible and miscible fluid flow; wettability; multiphase flow and relative permeability. Concepts applied to hydrocarbon reservoirs and fluid migration in soils including; characterization of pore space, pore level modelling of porous media, routine and advanced core analysis. Similarities and differences between hydrocarbon reservoirs and soils.

Corequisite(s): Third-year standing, or higher, in Chemical Engineering or Oil & Gas Engineering.

Antirequisite(s): Credit for Petroleum Engineering 513 and 313 will not be allowed.

Petroleum Engineering 515 3 units; H(3-2)

Drilling and Well Completions

An introduction to drilling; overview of petroleum engineering geology; basic rock properties. Fluid flow in porous media. Drilling rig types, components and selection; overview of drilling operations; drilling fluids and mud systems; drilling hydraulics; casing design and casing seat selections; cementing; formation damage, well completions. Special topics including: directional drilling; blowout control; logging and coring; hole stability; planning and cost control; underbalanced drilling; coiled tubing drilling; offshore operations, environmental aspects.

Prerequisite(s): Engineering 311, 317 and Chemical Engineering 331 or Mechanical Engineering 341.

Corequisite(s): Petroleum Engineering 429 or 523.

Antirequisite(s): Credit for Petroleum Engineering 515 and 521 will not be allowed

Note: Priority will be given to students in the BSc Oil & Gas Engineering. All students are expected to attend the course field trip(s).

Petroleum Engineering 519 3 units; H(3-0)

Special Topics

Current advanced topics in Petroleum Engineering.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Petroleum Engineering 521 3 units; H(3-1)

Introduction to Drilling Engineering

Introduction to the physics of flow in porous media; overview of drilling operations; equipment; relevant processes and procedures; basic completion operation; environmental aspect of drilling and completion operations.

Prerequisite(s): Engineering 311, Engineering 317 or Energy Engineering 360, and Chemical Engineering 331 or Mechanical Engineering 341 or Energy Engineering 480.

Corequisite(s): Petroleum Engineering 429 or 523.

Antirequisite(s): Credit for Petroleum Engineering 521 and 515 will not be allowed.

Petroleum Engineering 523 3 units; H(3-1)

Introduction to Reservoir Engineering

Basic concepts of fluid flow in porous media; important reservoir rock and fluid properties affecting productivity; reserve estimation using volumetric and material balance methods in gas, gas-condensate and oil reservoirs; discussion of different reservoir drive mechanisms; aquifer models; decline analysis; Darcy's Law and single phase flow through porous media. Introduction to well testing, solution of radial diffusivity equation corresponding to infinite-acting and pseudo-steady state flow of slightly compressible fluids and real gases.

Prerequisite(s): Engineering 311 and one of Chemical Engineering 331, or Mechanical Engineering 341 or Energy Engineering 480.

Antirequisite(s): Credit for Petroleum Engineering 523 and 429 will not be allowed.

Petroleum Engineering 525 3 units; H(3-1)

Waterflooding and Enhanced Oil Recovery

Review of rock-fluid properties; trapping and mobilization of residual oil; displacement theory; linear waterflood calculations; viscous fingering; flood patterns and sweep efficiency considerations; characterization of reservoir heterogeneity; analytical waterflood prediction models; black-oil reservoir simulation models; design engineering aspects of waterflooding; and overview of enhanced recovery methods.

Prerequisite(s): Petroleum Engineering 523 or 429.

Petroleum Engineering 531 3 units; H(2-6)

Design for Oil and Gas Engineering II

Team Design Project continuing from Petroleum Engineering 511. Detailed design of large scale development and commercial exploitation of a petroleum resource. Topics considered will include: reservoir simulation; drilling and completion design; specification of petroleum processing equipment such as heaters, heat exchangers,

contacting and separating equipment; safety and environmental issues; economic evaluation.

Prerequisite(s): Petroleum Engineering 511.

Petroleum Engineering 533 3 units; H(3-1)

Petroleum Production Engineering
Principles of oil and gas production mechanics. Analysis of fluid flow from the formation to the surface facility. Reservoir inflow performance. Wellbore hydraulics and multiphase flow. Nodal analysis for production optimization Acidizing and hydraulic fracturing. Water and gas coning. Diagnosis of production problems. Artificial lift; Sucker pumping; electrical submersible pumps; progressing cavity pumps; gas lift.

Prerequisite(s): Petroleum Engineering 523 or 429.

Petroleum Engineering 543 3 units; H(3-0)

Geological Characterization of Oil and Gas Reservoirs
Static model for field development. Review petroleum reservoir geology, geological depositional environments, petrophysical and geostatistical analysis, and reserves estimation. Emphasis on data analysis and integration for a model suitable for reservoir simulation.

Prerequisite(s): Petroleum Engineering 523 or 429.

Corequisite(s): Petroleum Engineering 507.

Petroleum Engineering 551 3 units; H(1-4/2)

Petroleum Engineering Laboratory
Experiments on Fluid Flow in Oil & Gas production. Measurements of porous rock and fluid properties, such as relative permeability, fluid dispersion, fluid phase behaviour and viscosity, unstable fluid displacement.

Prerequisite(s): Chemical Engineering 427, Petroleum Engineering 313 or 513 and 429 or 523.

Antirequisite(s): Credit for Petroleum Engineering 551 and Chemical Engineering 551 will not be allowed.

Petroleum Engineering 555 3 units; H(3-1T)

Oil and Gas Field Safety and Equipment
Review of safety issues, blow outs, fire and other hazards, hydrate formation and decomposition, H2S and other toxic gases, safety standards, impact of petroleum operations on the environment, handling and safe transportation and disposal of petroleum wastes.

Petroleum Engineering 561 3 units; H(3-1T)

Fuel Science and Technology
Classification of fuels. Origin, geology, production and processing of fossil fuels. Supply, consumption and demand for fuels - historical patterns and future trends. Thermodynamics and reaction kinetics of combustion. Physical and chemical properties and influence on fuel utilization. Ecological, efficiency, safety, economic considerations. Non-conventional fuels. Transportation and handling.

Petroleum Engineering 563 3 units; H(3-1T)

Materials Aspects of Oil and Gas Production
Material selection processes for the oil and gas industry covering piping, vessels and other components. Basics of corrosion, stress corrosion, hydrogen embrittlement. Corrosion prevention techniques for aqueous and gaseous corrosion. High temperature material behaviour and design procedures.

Petroleum Engineering 571 3 units; H(3-1T)

Unconventional Oil Production
Description and analysis of heavy oil geology and heavy oil recovery technologies. Discussion of heavy oil production mechanisms and methods, recovery process design, transportation, facilities, marketing, economics, and environmental issues.

Prerequisite(s): Petroleum Engineering 429 or 523.

Antirequisite(s): Credit for Petroleum Engineering 571 and 519.01 will not be allowed.

Petroleum Engineering 573 3 units; H(3-1T)

Tight Oil and Unconventional Gas Exploitation
Overview of tight oil and unconventional gas resources (tight gas, shale gas, tight oil, shale oil, coal bed methane, and natural gas hydrates) in a 'Total Petroleum System'. Geological aspects, drilling, completion and stimulation methods; reservoir characterization by petrophysics and well test analysis; forecasting methods; environmental and regulatory issues; economics and cost drivers.

Prerequisite(s): Petroleum Engineering 429 or 523.

Antirequisite(s): Credit for Petroleum Engineering 573 and 519.02 will not be allowed.

Petroleum Land Management PLMA

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Petroleum Land Management 475 3 units; H(3-1.5T)

Introduction to Petroleum Land Management
Petroleum land management including both technical and economic considerations in the search for and development and marketing of oil and gas resources. A field trip and/or simulation exercise may be required.

Prerequisite(s): Admission to the Haskayne School of Business, the Bachelor of Commerce Petroleum Land Management concentration, and 60 units (10.0 full-course equivalents) including Business and Environment 395.

Corequisite(s): Petroleum Land Management 477.

Note: One 200-level course in Geology is recommended.

Petroleum Land Management 477 3 units; H(3-1.5T)

Introduction to Oil and Gas Agreements
The concepts of ownership in the Canadian oil and gas industry, including Crown and freehold leases, basic oil and gas agreements, and assignment documentation.

Prerequisite(s): Admission to the Haskayne School of Business, the Bachelor of Commerce Petroleum Land Management concentration, and 60 units (10.0 full-course equivalents) including Business and Environment 395.

Corequisite(s): Petroleum Land Management 475.

Note: One 200-level course in Geology is recommended.

Petroleum Land Management 573 3 units; H(3-0)

Petroleum Business Agreements
Legal requirements in the acquisition and exploration of and production from oil and gas rights in Canada.

Prerequisite(s): Admission to the Haskayne School of Business, the Bachelor of Commerce Petroleum Land Management concentration, Petroleum Land Management 475, 477 and Business and Environment 395.

Petroleum Land Management 579 3 units; H(3-0)

Petroleum Land Management Policy
Prepare graduates to effectively contribute to the management of oil and gas properties throughout the life of the properties by increasing the understanding and awareness of corporate resource property valuation techniques.

Prerequisite(s): Admission to the Haskayne School of Business, the Bachelor of Commerce Petroleum Land Management concentration, Petroleum Land Management 475, 477, 573, 583, Business and Environment 395 and Finance 317.

Petroleum Land Management 583 3 units; H(3-0)

Management of Energy Regulation
Overview of key regulations and surface regulatory principles important to energy resources.

Prerequisite(s): Admission to the Haskayne School of Business, the Bachelor of Commerce Petroleum Land Management concentration, Petroleum Land Management 475, 477 and Business and Environment 395.

Corequisite(s): Petroleum Land Management 573.

Petroleum Land Management 587 3 units; H(3-0)

Cases in Petroleum Land Management
A "Hands on" case approach to the typical situations and decision-making processes faced by landmen. Historical perspectives, contemporary tactics, and modern applications for Land departments.

Prerequisite(s): Admission to the Haskayne School of Business, the Bachelor of Commerce Petroleum Land Management concentration, Petroleum Land Management 475, 477, 573, 583 and Finance 317.

Corequisite(s): Petroleum Land Management 579.

Philosophy PHIL

Instruction offered by members of the Department of Philosophy in the Faculty of Arts.

Illustrative Philosophy Course Groupings

This listing is provided to assist students in their selection of related groups of Philosophy courses. Detailed descriptions of all courses and sections of courses may be obtained from the Department Office.

Introductory:

201, 249†, 259, 275†, 279†

History of Philosophy:

301, 303, 305, 307, 309, 311, 401, 403, 405, 407†, 408†, 411, 501, 505, 507, 609

Moral Philosophy:

249†, 313†, 314, 329†, 330, 345, 347, 397, 449, 451, 547, 549, 649

Legal Philosophy, and Social and Political Philosophy:

313†, 325, 329†, 425, 453, 525, 553, 653

Metaphysics and Philosophy of Mind:

383, 395, 407†, 408†, 423, 483, 523, 583, 623, 683

Logic:

275†, 279†, 377, 379, 479, 579, 679

Philosophy of Logic, Philosophy of Language:

307†, 407†, 408†, 471, 571, 671, 691

Epistemology and Philosophy of Science:

361, 367, 461, 467, 517, 561, 565, 567, 661, 667

Other Courses:

315, 317, 331, 333, 335, 337, 409, 435, 499, 527, 589, 595, 590, 597, 599, 601, 627

†Courses which appear in more than one category.

Junior Courses

Note: Philosophy 201, 249, 275 and 279 have no prerequisites and may be taken in any order, except that 275 is not open to students with credit in 279.

Philosophy 201 **3 units; H(3-1T)**

Mind, Matter and God

Provides an introduction to philosophy through the discussion of selected topics such as skepticism, perception, personal identity, free will and determinism, God.

Philosophy 249 **3 units; H(3-1T)**

Morality, Virtue and Society

Provides an introduction to philosophy through the discussion of morality, virtue and the role of morality in society.

Philosophy 259 **3 units; H(3-1T)**

Sex, Love and Death

Topics to be addressed may include the nature of sex, love, and death, the relation between sex and love, sexual ethics, sexual perversion, sexual harassment and pornography, abortion, suicide, euthanasia and the value of life.

Philosophy 275 **3 units; H(3-1T)**

Scientific and Critical Reasoning

Students will develop their critical thinking skills by learning how to analyze logical reasoning in a variety of contexts, from everyday discourse to scientific reports.

Antirequisite(s): Credit for Philosophy 275 and either 279 or 377 will not be allowed.

Philosophy 279 **3 units; H(3-1T)**

Logic I

Sentential and first-order logic from both deductive and semantic points of view. Some elementary metatheorems.

Antirequisite(s): Credit for Philosophy 279 and 377 will not be allowed.

Senior Courses

Note: Senior courses will not necessarily be taught in every academic year, but will be available in accordance with student requirements and the availability of staff. The Department will normally offer two of Philosophy 301, 303, 305 each academic year.

Philosophy 301 **3 units; H(3-0)**

The Classical Period

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from the Pre-Socratics, through Plato and Aristotle, to the Hellenistic and Roman philosophers will be discussed.

Philosophy 303 **3 units; H(3-0)**

The Medieval and Renaissance Period

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from Augustine to Montaigne, such as Boethius, Abelard, Ibn Rushd, Maimonides, Aquinas, Ockham, and Erasmus will be discussed.

Philosophy 305 **3 units; H(3-0)**

The Seventeenth and Eighteenth Centuries

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from Descartes to Kant will be discussed.

Philosophy 307 **3 units; H(3-0)**

Nineteenth or Twentieth Century Analytic Philosophy

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from Mill to Quine, such as Frege, Russell, Wittgenstein, Ayer, Camap, Austin James, Dewey and Peirce will be discussed.

Philosophy 309 **3 units; H(3-0)**
(formerly Philosophy 369)

Nineteenth-Century European Philosophy

A study of some of the major currents in nineteenth-century European philosophy. Central figures in this tradition include Fichte, Schelling, Hegel, Feuerbach, Marx, Kierkegaard, Schopenhauer and Nietzsche. The particular works and authors studied may vary from year to year.

Philosophy 311 **3 units; H(3-0)**
(formerly Philosophy 469)

Twentieth-Century European Philosophy

A study of some of the major currents in twentieth-century European philosophy. Central figures in this tradition include Husserl, Heidegger, Sartre, Merleau-Ponty, Adorno, Marcuse, Habermas, Foucault, Derrida, Kristeva and Irigaray. The particular works and authors studied may vary from year to year.

Philosophy 313 **3 units; H(3-0)**

Bioethics

A critical and analytical examination of ethical and legal problems arising in and about health care. Issues to be considered may include euthanasia, abortion, the conditions for the withdrawal of treatment, the physician-patient relationship, research on human subjects, genetic engineering. The practical applications of ethical and legal theory are emphasized. Students with a background or special interest in the biological and medical sciences, health care, or medical jurisprudence may find this course particularly helpful.

Philosophy 314 **3 units; H(3-1T)**

Information Technology Ethics

A critical and analytical examination of ethical and legal problems arising in and about information technology. Issues to be considered might include hacking, online privacy, intellectual property rights, artificial intelligence, globalization and regulation issues, cheating in online games, and others.

Philosophy 315 **3 units; H(3-0)**

Philosophy in Literature

Designed to acquaint the student with various philosophical problems, theories and points of view as these find expression in works of literature from classical times to the present. Authors to be studied may range from Homer to Orwell and Huxley. In years when the course is offered a course outline giving authors and aspects of philosophy to be treated will be available from the Department office.

Philosophy 317 **3 units; H(2-3)**

Philosophy and Film

Designed to acquaint the student with various philosophical problems, theories and points of view as these find expression in works of film.

Philosophy 325 **3 units; H(3-0)**

Law and Morality

An introduction to legal and political philosophy. Topics studied may include the relation between law and morality, the nature of legal authority and political and social theory. For prospective law students and for undergraduates who want to increase their understanding of the character and role of law in a society.

Antirequisite(s): Credit for Philosophy 325 and 319 will not be allowed.

Philosophy 329 **3 units; H(3-0)**

Business Ethics

A critical and analytical examination of some central moral problems that arise in and for business. Emphasis throughout the course will be placed not only on the details of the particular problems studied but also on the conceptual and other tools needed to understand and resolve or solve such problems. Topics to be discussed will include the moral responsibilities and rights of corporations and their officers, codes of business ethics, and conflicts of responsibilities and rights.

Philosophy 330 **3 units; (3-0)**

Philosophy of Money

An examination of the philosophical issues surrounding money. This may include metaphysics of value, the justice of wealth distribution, and the ethics of wealth and charity. May include both historical and contemporary philosophical discussions of money.

Antirequisite(s): Credit for Philosophy 330 and 399.02 will not be allowed.

Philosophy 331 **3 units; H(3-0)**

Philosophy of Religion

A philosophical examination of the fundamental concepts of religious thinking.

Prerequisite(s): Religious Studies 205 or a previous course in Philosophy.

Philosophy 333 **3 units; H(3-0)**

Philosophy and Art
An examination of the criteria and concepts employed in aesthetic evaluation.

Philosophy 335 **3 units; H(3-0)**

Asian Philosophy
This course considers traditional philosophical topics such as metaphysics, epistemology, logic, ethics, aesthetics, political philosophy, and environmental philosophy as they are dealt with in Asian traditions or texts, as well as topics that are more specific to Asian traditions, such as actionless action, sagehood, karma, rebirth, enlightenment/liberation, egoism, and attachment.

Philosophy 337 **3 units; H(3-0)**

Philosophy, Feminism and Gender
Study of social and political issues arising from philosophical considerations of gender including the intersection of gender and race. Particular attention will be paid to feminist analyses of gender. Topics may include feminist methodology as well as gender issues in such areas as knowledge and science, language, ethics and political theory.

Philosophy 345 **3 units; H(3-0)**
(formerly Philosophy 447)

Issues in Environmental Ethics
A philosophical examination of selected issues concerning how human beings ought to conduct themselves in relation to other living species and the natural environment. Topics may include: obligations to future generations; animal liberation theories; population policy; pollution; the value of species diversity and species preservation; biocentric and holistic ethical theories of environment; ethical dimension of environmental policy formation.

Philosophy 347 **3 units; H(3-0)**

Contemporary Moral Problems
A critical and analytical examination of some current moral issues. Topics to be investigated may include: authority, religion in society, suicide, sexual morality, abortion, the legal enforcement of morality, justice.

Philosophy 361 **3 units; H(3-0)**

Evidence
An investigation of philosophical perspectives on evidence. Topics may include the nature of evidence, whether and how much evidence is required for reasonable belief and action, what sort of evidence might be required for moral, scientific, religious, or mathematical belief, and the role of evidence in medical, legal, political, and social contexts.

Philosophy 367 **3 units; H(3-0)**

Science and Philosophy
For students in any discipline who would like to understand some of the fundamental principles of scientific enquiry. Topics will include scientific explanation, theory, prediction and confirmation.

Philosophy 377 **3 units; H(3-0)**

Elementary Formal Logic
Sentential and first-order logic, with identity and descriptions, from both deductive and semantic points of view. Completeness, compactness, decidability for sentential logic.

Antirequisite(s): Credit for Philosophy 377 and 279 will not be allowed.

Philosophy 379 **3 units; H(3-0)**

Logic II
Introduction to the metatheory of logical systems. Completeness, compactness, Löwenheim-Skolem, and undecidability theorems for first-order logic. Preview of non-standard models, second-order logic, and Göedel's first incompleteness theorem.

Prerequisite(s): Philosophy 279 or 377.

Philosophy 383 **3 units; H(3-0)**

Philosophy and Psychology
A study of topics such as: thought, emotions, action and the will, mind-body identity, personal identity, and theories about the nature of mind.

Antirequisite(s): Credit for Philosophy 383 and 381 will not be allowed.

Philosophy 395 **3 units; H(3-0)**

Mind and World
An intensive study of selected topics in philosophy of mind, metaphysics and epistemology. Intended for philosophy majors, including students in the history and philosophy of science program.

Prerequisite(s): 12 units in Philosophy and admission to the Philosophy major or minor program.

Philosophy 397 **3 units; H(3-0)**

Value Theory
An intensive study of selected topics in value theory. Intended for philosophy majors, including majors in the religious studies and applied ethics program.

Prerequisite(s): Second year standing in Philosophy or in Religious Studies and Applied Ethics.

Philosophy 399 **3 units; H(3-0)**

Topics in Philosophy
A detailed examination of a topic or tradition in European or Anglo-American philosophy. In years when the course is being offered a detailed course outline giving the topic or tradition to be discussed will be available.

MAY BE REPEATED FOR CREDIT

Philosophy 401 **3 units; H(3-0)**

A Classical Philosopher
A study of the writings of a philosopher from the classical period.

Prerequisite(s): Two previous courses in philosophy one of which must be Philosophy 301, 303, 305, 307, 309 or 311.

MAY BE REPEATED FOR CREDIT

Philosophy 403 **3 units; H(3-0)**

A Medieval or Renaissance Philosopher
A study of the writings of a philosopher from the medieval or renaissance period.

Prerequisite(s): Two previous courses in Philosophy one of which must be Philosophy 301, 303, 305, 307, 309 or 311.

MAY BE REPEATED FOR CREDIT

Philosophy 405 **3 units; H(3-0)**

A Seventeenth- or Eighteenth-Century Philosopher
A study of the writings of a seventeenth- or eighteenth-century philosopher.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 301, 303, 305, 307, 309 or 311.

MAY BE REPEATED FOR CREDIT

Philosophy 407 **3 units; H(3-0)**

A Nineteenth- or Twentieth-Century Philosopher
A study of the writings of a nineteenth- or twentieth-century philosopher.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 301, 303, 305, 307, 309 or 311.

MAY BE REPEATED FOR CREDIT

Philosophy 408 **3 units; H(3-0)**

A Philosopher in the European Tradition - Nineteenth Century to Present
A study of the writings of a philosopher from the European tradition, emphasizing the influences of and on other philosophers and movements within the tradition.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 309 or 311.

MAY BE REPEATED FOR CREDIT

Philosophy 411 **3 units; H(3-0)**

Topics in the History of Philosophy
An investigation of a historical theme or movement in philosophy.

Prerequisite(s): Two previous courses in Philosophy one of which must be Philosophy 301, 303, 305, 307, 309 or 311.

MAY BE REPEATED FOR CREDIT

Philosophy 423 **3 units; H(3-0)**

Metaphysics
An examination of some central topics in metaphysics.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level, or higher, and one of which must be 201 or 395.

Antirequisite(s): Credit for Philosophy 423 and 421 will not be allowed.

Philosophy 425 **3 units; H(3-0)**

Philosophy of Law
An investigation of philosophical accounts of the nature of law and legal systems. Acquaints the student with central positions in jurisprudence, such as natural law, legal realism and legal positivism; and relations between law and morality.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level, or higher, and one of which must be Philosophy 249, 325 or 397.

Antirequisite(s): Credit for Philosophy 425 and 319 will not be allowed.

Philosophy 449 **3 units; H(3-0)**

Contemporary Meta-Ethics
A study of recent theories about the meaning of moral terms, the nature of moral reasoning, and the relations between facts and values. Theories to be studied may include naturalism, intuitionism, emotivism, prescriptivism, and nihilism.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level, or higher, and one of which must be Philosophy 249 or 397.

Philosophy 451 **3 units; H(3-0)**
(formerly Philosophy 349)

Contemporary Ethical Theories
A detailed investigation of some central normative ethical theories, including utilitarian, contractarian, and deontological theories.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level or higher, and one of which must be either Philosophy 249 or 397.

Philosophy 453 **3 units; H(3-0)**

Social and Political Philosophy
A study of fundamental issues in social and political thought. Topics which may be studied include: rights, justice, authority, equality, freedom, democracy, property, liberalism, communitarianism, socialism, and Marxism.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level, or higher, and one of which must be Philosophy 249 or 397.

Philosophy 461 **3 units; H(3-0)**

Epistemology
An examination of some central topics in the theory of knowledge.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level, or higher, and one of which must be Philosophy 201 or 395.

Antirequisite(s): Credit for Philosophy 461 and 463 will not be allowed.

Philosophy 467 **3 units; H(3-0)**

Problems in the Philosophy of Science
An examination of the central methodological and foundational issues arising in the sciences.

Prerequisite(s): Two previous courses in Philosophy one of which must be Philosophy 275, 279 or 377 and one of which must be Philosophy 201 or 395.

Philosophy 471 **3 units; H(3-0)**
(formerly Philosophy 371)

Philosophy of Language
An examination of some central topics in the philosophy of language.

Prerequisite(s): Philosophy 279 or 377.

Philosophy 473 **3 units; H(3-0)**

Philosophy of Logic
An examination of some central topics in the philosophy of logic.

Prerequisite(s): Philosophy 279 or 377.

Philosophy 479 **3 units; H(3-0)**

Logic III
Advanced metatheory for logical systems. Gödel's incompleteness theorems, models of arithmetic, and definability.

Prerequisite(s): Philosophy 379.

Philosophy 483 **3 units; H(3-0)**

Philosophy of Mind
An examination of some central topics in the philosophy of mind.

Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 300 level, or higher, and one of which must be Philosophy 201 or 395.

Antirequisite(s): Credit for Philosophy 483 and 481 will not be allowed.

Philosophy 499 **3 units; H(3-0)**
(formerly Philosophy 409)

Topics in Philosophy
An intensive study of a selected topic in Philosophy.

Prerequisite(s): Two previous courses in Philosophy, at least one of which is at the 300 level.

MAY BE REPEATED FOR CREDIT

Philosophy 501 **3 units; H(3-0)**

Advanced Topics in Ancient or Medieval Philosophy
An investigation into central issues in ancient or medieval philosophy.

Prerequisite(s): 6 units in Philosophy, at least one of which must be a course in the History of Philosophy and one of which must be at the 400 level or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 505 **3 units; H(3-0)**

Advanced Topics in Modern Philosophy
Prerequisite(s): Two previous courses in Philosophy, at least one of which must be a course in the History of Philosophy and one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 507 **3 units; H(3-0)**

Advanced Topics in Nineteenth- or Twentieth-Century Philosophy
An investigation of central issues in nineteenth- and twentieth-century philosophy.

Prerequisite(s): Two previous courses in philosophy at least one of which must be a course in the History of Philosophy and at least one of which must be at the 400 level.

MAY BE REPEATED FOR CREDIT

Philosophy 517 **3 units; H(3-0)**

Advanced Topics in the History and Philosophy of Science
An intensive investigation of one or more issues in the history and philosophy of science.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 201, 395, 421, 423, 461, 463, 467, 481 or 483 and one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 519 **3 units; H(3-0)**
(Linguistics 519)

Formal Semantics of Natural Language
Central issues in the logical semantics of natural language, focusing on topics such as quantification, scope, and the interpretation of pronouns.

Prerequisite(s): Philosophy 279 or 377. Philosophy 371 or Linguistics 319 recommended.

Antirequisite(s): Credit for Philosophy 519 and Linguistics 509 will not be allowed.

Philosophy 523 **3 units; H(3-0)**

Advanced Topics in Metaphysics
An investigation of one or more issues in metaphysics.

Prerequisite(s): Two previous courses in philosophy at least one of which must be at the 400 level and one of which must be one of Philosophy 201, 395, 421, 423, 461, 463, 467, 481, or 483.

MAY BE REPEATED FOR CREDIT

Philosophy 525 **3 units; H(3-0)**

Advanced Topics in Philosophy of Law
An intensive investigation of one or more issues in the philosophy of law.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 249, 397, 425, 449 or 453 and at least one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 527 **3 units; H(3-0)**

Advanced Topics in the Philosophy of Religion
An investigation of one or more issues in the philosophy of religion.

Prerequisite(s): Two previous courses in Philosophy at least one of which must be at the 400 level.

MAY BE REPEATED FOR CREDIT

Philosophy 547 **3 units; H(3-0)**

Advanced Topics in Applied Ethics
An intensive investigation of one or more issues in applied ethics.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 249, 397, 425, 449 or 453 and at least one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 549 **3 units; H(3-0)**

Advanced Topics in Ethics
An intensive investigation of one or more issues in normative ethical theory or meta-ethics.

Prerequisite(s): Two previous courses in Philosophy, one of which must be Philosophy 249, 397, 425, 449 or 453 and at least one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 553 **3 units; H(3-0)**

Advanced Topics in Political Philosophy
An intensive investigation of one or more issues in political philosophy.

Prerequisite(s): Two previous courses in Philosophy, one of which must be 249, 397, 425, 449 or 453 and at least one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 561 **3 units; H(3-0)**

Advanced Topics in Epistemology
An investigation of one or more issues in epistemology

Prerequisite(s): Two previous courses in Philosophy at least one of which must be at the 400 level and one of which must be one of Philosophy 201, 395, 421, 423, 461, 463, 467, 481 or 483.

MAY BE REPEATED FOR CREDIT

Philosophy 565 **3 units; H(3-0)**

Philosophical Topics in the Sciences
A study of philosophical issues arising in a particular area of science. Possible topics include philosophy of biology, philosophy of social sciences, and philosophy of physics. Consult Department for specific topic in a given semester.

Note: This course is intended for students who have already done advanced work either in philosophy or in one of the sciences.

MAY BE REPEATED FOR CREDIT

Philosophy 567 **3 units; H(3-0)**

Advanced Topics in Philosophy of Science
An intensive study of one or more issues in the philosophy of science.

Prerequisite(s): Two previous courses in Philosophy, one of which must be 201, 395, 421, 423, 461, 463, 467, 481 or 483 and one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 571 **3 units; H(3-0)**

Advanced Topics in Philosophy of Logic and Philosophy of Language
An intensive study of one or more issues in the philosophy of logic or language

Prerequisite(s): Two previous courses in Philosophy, one of which must be either Philosophy 279 or 377, and one of which must be at the 400 level, or higher.

MAY BE REPEATED FOR CREDIT

Philosophy 579 **3 units; H(3-0)**

Advanced Topics in Logic
An investigation of one or more issues in logic.

Prerequisite(s): Philosophy 279 or 377.

MAY BE REPEATED FOR CREDIT

Philosophy 583 **3 units; H(3-0)**

Advanced Topics in Philosophy of Mind
An investigation of one or more issues in philosophy of mind

Prerequisite(s): Two previous courses in philosophy at least one of which must be at the 400 level and one of which must be one of Philosophy 201, 395, 421, 423, 461, 463, 467, 481 or 483.

MAY BE REPEATED FOR CREDIT

Philosophy 590 **6 units; F(0-3)**

Honours Thesis
Prerequisite(s): Admission to the Honours program and consent of the Department.

Philosophy 595 **3 units; H(3-0)**

Directed Reading
Directed reading for students in their third or fourth years. This course is intended primarily for Majors and Honours students, but is open to others.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 597 **3 units; H(3S-0)**

Honours Seminar
Prerequisite(s): Consent of the Department.

Corequisite(s): Philosophy 590.

Philosophy 599 **3 units; H(3-0)**
(formerly Philosophy 589)

Advanced Topics in Philosophy
Prerequisite(s): Two previous courses in Philosophy, at least one of which must be at the 400 level or above.

MAY BE REPEATED FOR CREDIT

Graduate Courses

With the exception of Philosophy 590 and Philosophy 595, courses numbered 500-599 may be taken for credit in the Graduate program in Philosophy. Details of the specific topics to be taught in all 600-level courses in Philosophy will be announced in the Department brochure and, when possible, in the Schedule of Classes.

Philosophy 601 **3 units; H(3-0)**

Seminar in Selected Problems
MAY BE REPEATED FOR CREDIT

Philosophy 603 **3 units; H(3-0)**

Graduate Proseminar

Philosophy 609 **3 units; H(3-0)**

Topics in the History of Philosophy
MAY BE REPEATED FOR CREDIT

Philosophy 623 **3 units; H(3-0)**
(formerly Philosophy 621)

Topics in Metaphysics
MAY BE REPEATED FOR CREDIT

Philosophy 627 **3 units; H(3-0)**

Topics in the Philosophy of Religion
MAY BE REPEATED FOR CREDIT

Philosophy 649 **3 units; H(3-0)**

Topics in Ethics
MAY BE REPEATED FOR CREDIT

Philosophy 653 **3 units; H(3-0)**

Topics in Social and Political Philosophy
MAY BE REPEATED FOR CREDIT

Philosophy 661 **3 units; H(3-0)**
(formerly Philosophy 663)

Topics in Epistemology
MAY BE REPEATED FOR CREDIT

Philosophy 667 **3 units; H(3-0)**

Topics in Philosophy of Science
MAY BE REPEATED FOR CREDIT

Philosophy 671 **3 units; H(3-0)**

Topics in Philosophical Logic and the Philosophy of Language
MAY BE REPEATED FOR CREDIT

Philosophy 679 **3 units; H(3-0)**

Topics in Logic
MAY BE REPEATED FOR CREDIT

Philosophy 683 **3 units; H(3-0)**
(formerly Philosophy 681)

Topics in the Philosophy of Mind
MAY BE REPEATED FOR CREDIT

Philosophy 691 **3 units; H(3-0)**

Topics in Philosophical Analysis
MAY BE REPEATED FOR CREDIT

Philosophy 695 **3 units; H(3-0)**

Graduate Directed Reading
MAY BE REPEATED FOR CREDIT

Physical Education PHED

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, and Kinesiology.

Senior Courses

Physical Education 321 **3 units; H(1-3)**

Games I
Games and sports suited to the needs of children and youth in schools.

Prerequisite(s): Kinesiology 201, 321 and admission to the Leadership in Pedagogy and Coaching Major.

Physical Education 333 **3 units; H(1-3)**

Gymnastics and Track and Field
Dominant movement patterns in gymnastic activities and the run-jump-throw skills of track and field.

Prerequisite(s): Kinesiology 201 and 321 and admission to the Leadership in Pedagogy and Coaching Major.

Physical Education 349 **3 units; H(1-3)**

Activities in Alternative Environments
Fundamental principles of creating an effective learning environment in the school Physical Education Alternative Environments setting (K to Grade 12).

Prerequisite(s): Kinesiology 201, 321 and admission to the Leadership in Pedagogy and Coaching Major.

Physical Education 421 **3 units; H(1-3)**

Games II
Games and sports suited to the needs of children and youth in schools.

Prerequisite(s): Kinesiology 201, 321 and admission to the Leadership in Pedagogy and Coaching Major.

Physics PHYS

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Notes:

For listings of related courses, see Astronomy, Astrophysics, Medical Physics and Space Physics.

Students intending to register in any Physics course should read the relevant Faculty of Science Program section of this Calendar.

Module for First Year and First Term Second Year Physics Courses

Physics 106 **0.75 units; E(12 hours)**

Module M6 Thermal Physics
Thermal Physics. Gas laws; kinetic theory of gases; temperature; internal energy; specific heat; energy transfer; laws of thermodynamics; PVT diagrams.

Prerequisite(s): Consent of the Department.

Note: Taught as part of Physics 223. Contact the instructor in Physics 223 regarding the schedule.

Junior Courses

Physics 211 **3 units; H(4-2)**

Mechanics
Introductory Newtonian particle mechanics and rigid bodies in rotational equilibrium: Kinematics, Newton's laws, conservation of momentum and mechanical energy.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Note: Physics 30 is recommended as preparation for Physics 211.

Antirequisite(s): Credit for Physics 211 and either 221 or 227 will not be allowed. Not open to students who meet ALL of the following criteria: 70 per cent or higher in Physics 30, 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30 and 60 per cent or higher in Mathematics 31, except with special Departmental permission.

Note: Physics 211 and 221 differ in their prerequisites, but cover the same material and have the same examinations and tutorial quizzes. Physics 211 has an extra lecture hour per week to deal with certain topics from High School Physics and Mathematics 31. Mathematics 31 is recommended.

Physics 221 **3 units; H(3-2)**

Mechanics
Introductory Newtonian particle mechanics and rigid bodies in rotational equilibrium: Kinematics, Newton's laws, conservation of momentum and mechanical energy.

Prerequisite(s): A grade of 70 per cent or higher in Physics 30; 50 per cent or higher in Mathematics 31; and 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30 or a grade of "B-" or 70 per cent or better in Mathematics II (offered by Continuing Education).

Antirequisite(s): Credit for Physics 221 and either 211 or 227 will not be allowed.

Physics 223 **3 units; H(3-1T-3/2)**

Introductory Electromagnetism, and Thermal Physics
Electrical forces and energy. Static electric fields due to point charges. Parallel-plate capacitor. Simple DC circuits. Lorentz force. Static magnetic fields generated by electric currents. Electromagnetic induction. Gas Laws; kinetic theory of gases; temperature, thermal energy, specific heat; energy transfer; laws of thermodynamics; PVT diagrams.

Prerequisite(s): Physics 211 or 221 or 227.

Note: For students intending to major in Biological Sciences, Chemistry, Geology, or Geophysics.

Physics 227 **3 units; H(3-2T-2)**

Classical Physics
Kinematics and statics of rigid bodies; conservation laws; rotational mechanics.

Prerequisite(s): A grade of 75 per cent or higher in Physics 30; 60 per cent or higher in Mathematics 31; and 75 per cent or higher in Mathematics 30-1 or Pure Mathematics 30 or a grade of "B" or 70 per cent or better in Mathematics II (offered by Continuing Education) and admission to Physics, Astrophysics, Chemical Physics, Chemistry, Natural Science (Physics Concentration), or Environmental Science (Physics Concentration).

Antirequisite(s): Credit for Physics 227 and 321 will not be allowed.

Note: Natural Sciences students without approved concentrations who are interested in concentrating in Physics should contact the Department for approval.

Physics 255 **3 units; H(3-3)**

Electromagnetic Theory I
Electrostatics, DC circuits, calculation of magnetic intensity from currents, motion of charged particles in electric and magnetic fields, electromagnetic induction, transient effects in capacitors and inductors, electric and magnetic properties of materials.

Prerequisite(s): Physics 211 or 221 or 227; Applied Mathematics 217 or Mathematics 249 or 251 or 265 or 275 and admission to Physics, Astrophysics, Chemical Physics, Chemistry, Natural Science (Physics Concentration), or Environmental Science (Physics Concentration).

Antirequisite(s): Credit for Physics 255 and any of 259 or 323 or 355 will not be allowed.

Note: Prior completion of or concurrent registration in Mathematics 277 is highly recommended. Natural Sciences students without approved concentrations who are interested in concentrating in Physics should contact the Department for approval.

Physics 259 **3 units; H(4-2)**

Electricity and Magnetism (for students in Engineering)
Electric and magnetic fields related to charges and current through Maxwell's equations. Energy stored in fields, potential energy, and voltage. Conductors, insulators, and dielectrics. Resistance, capacitance, and inductance with applications to RC/RL circuits.

Prerequisite(s): Applied Mathematics 217 or Mathematics 265 or 275 and Mathematics 211.

Antirequisite(s): Credit for Physics 259 and either 255 or 323 will not be allowed.

Note: Prior completion of or concurrent registration in Mathematics 277 is highly recommended.

Physics 271 **3 units; H(3-0)**

How Things Work
Physics behind many common devices will be discussed. Topics will be chosen from among the following: the use of simple and compound machines; waves, sound, acoustics; light and optics; household electric circuitry; magnetism.

Antirequisite(s): Credit for Physics 271 and any 200-level Physics course will not be allowed.

Note: Some previous exposure to physics, e.g., Science 10, is strongly recommended. Not intended for Physics majors, Natural Science Physics Concentrators, or Environmental Science Physics Concentrators. Will not count in the field of Physics.

Senior Courses

Physics 303 **3 units; H(3-0)**

Quantum Mysteries and Paradoxes
Aims to explain basic quantum phenomena for students outside the physical sciences. Topics covered may include wave-particle duality, quantum interference, as well as the paradoxes of entanglement and quantum nonlocality. Applications such as quantum cryptography and quantum teleportation are discussed, as are the philosophical interpretations of the quantum picture of the world.

Note: The course makes limited use of high-school algebra. Not intended for Physics majors and will not count in the field of Physics.

Physics 321 **3 units; H(3-2T)**

Harmonic Motion, Waves, and Rotation
Simple harmonic oscillations. Progressive waves in one dimension. Energy of a wave. Superposition. Standing waves. Newtonian mechanics of rigid body rotation.

Prerequisite(s): Physics 211 or 221 and Mathematics 211 or 213 and Mathematics 267 or 277 or 253 or Applied Mathematics 217.

Antirequisite(s): Credit for Physics 321 and 227 will not be allowed.

Physics 323 **3 units; H(3-3/2)**

Optics and Electromagnetism
Static electric fields due to charge distributions. Static magnetic fields due to current distributions. Time-dependent behaviour of capacitors and inductances. Geometrical optics: Thin lenses and curved mirrors. Physical optics: Interference and diffraction.

Prerequisite(s): Physics 211 or 221 or 227 and 223; and Applied Mathematics 217 or Mathematics 249 or 251 or 265 or 275.

Antirequisite(s): Credit for Physics 323 and either 255 or 259 will not be allowed.

Note: Prior completion of or concurrent registration in Mathematics 277 is highly recommended.

Physics 325 **3 units; H(3-3)**

Modern Physics
Origins of quantum mechanics, a historical perspective. Concepts of wave mechanics and applications. Nuclear physics and radioactivity. Topics include: Special Theory of Relativity, Electromagnetic waves, Blackbody radiation, Photoelectric Effect, X-rays and Bragg Diffraction, Compton Scattering, Atomic Structure, The Bohr Model, Atomic Spectra, Applications of the Schrödinger Wave Equation, Radioactivity, Nuclear Stability, Nucleosynthesis, Structure of the Nucleus, Elementary Particles.

Prerequisite(s): Physics 211 or 221 or 227; and 223 or 255 or 259 or 355; and Mathematics 211 or 213; and Mathematics 249 or 251 or 275 or Applied Mathematics 217.

Antirequisite(s): Credit for Physics 325 and 209 will not be allowed.

Physics 341 **3 units; H(3-3/2)**

Classical Mechanics I
Forced and damped harmonic oscillations with real and complex numbers; anharmonic oscillators; central force motion and scattering; non-inertial frames; 2- and 3-body problems; applications of linear differential equations and complex numbers.

Prerequisite(s): Physics 227 or 321; and Mathematics 211 or 213; and Applied Mathematics 219 or Mathematics 253 or 267 or 277 or 283.

Physics 343 **3 units; H(3-0)**

Classical Mechanics II
Rotating frames of reference; general rotations of rigid bodies; moment of inertia tensor; eigenvalues and eigenvectors; Lagrangian and Hamiltonian mechanics; potential theory and tides; perturbation theory.

Prerequisite(s): Physics 341.

Physics 365 **3 units; H(3-3/2)**

Acoustics, Optics and Modern Physics (for students in Engineering)
Wave motion as applied to acoustics and physical optics. Wave-particle duality applied to light

and matter; electron energy levels of atoms and crystals.

Prerequisite(s): Applied Mathematics 219 or Mathematics 277; and Physics 259.

Antirequisite(s): Credit for Physics 365 and 369 will not be allowed.

Note: Required for Electrical Engineering students. Open to all other engineering students, excluding geomatics.

Physics 369 **3 units; H(3-3/2)**

Acoustics, Optics and Radiation (for students in Engineering)
Wave motion as applied to acoustics, geometric and physical optics, and radiant energy transfer. Traditional and modern applications.

Prerequisite(s): Applied Mathematics 219 or Mathematics 277; and Physics 259.

Antirequisite(s): Credit for Physics 369 and 365 will not be allowed.

Note: Required for Geomatics Engineering students. Open to all other engineering students, excluding electrical.

Physics 371 **3 units; H(3-0)**

Introduction to Energy
Energy and power will be discussed. Sources of energy such as wind power, solar power, nuclear power, geothermal energy and fossil fuels and related limitations will be considered. Generation and distribution of electricity will be discussed.

Note: Some previous exposure to physics, e.g., Science 10, is strongly recommended. Not intended for Physics majors and will not count in the field of Physics.

Physics 375 **3 units; H(3-3/2)**

Introduction to Optics and Waves
Geometrical Optics: lenses, mirrors, and other basic optical components. Wave motion. Description of light as a wave. Fermat's principle. Refraction, scattering, interference, diffraction, and polarization. Optical instruments (including telescopes and microscopes). Lasers and fibre optics if time allows.

Prerequisite(s): Physics 255; and one of Applied Mathematics 219 or Mathematics 253 or 267 or 277 or 283.

Physics 381 **3 units; H(1-3)**

Computational Physics I
Solution of problems associated with the analysis of physical systems, using digital computers, high level programming languages, and mathematical computation systems.

Prerequisite(s): Computer Science 217 or 231; and Physics 227.

Note: Prior completion of or concurrent registration in Physics 343 is highly recommended.

Physics 397 **3 units; H(2-1T-3)**

Applied Physics Laboratory I
Basic laboratory electronics, vacuum systems, and optical devices. Introduction to experimental control, data collection, and analysis. Fundamentals of error analysis and error propagation.

Note: Prior completion of or concurrent registration in Physics 223 or 255 or 259 is highly recommended.

Physics 443 **3 units; H(3-0)**

Quantum Mechanics I
Basic postulates of quantum mechanics and their physical interpretation. Schrödinger's time-dependent and time-independent equations. Single particle in a potential field. Basic applications of quantum mechanics to atomic, molecular, optical, nuclear, and solid state physics, as well as quantum information science. Topics may include notions of quantum entanglement, non-locality and teleportation.

Prerequisite(s): Physics 325 and 343 and Mathematics 311.

Note: Prior completion of or concurrent registration in Mathematics 367 or 377 is highly recommended.

Physics 449 **3 units; H(3-0)**

Statistical Mechanics I
State-counting; classical distributions; origins and role of entropy; equilibrium; microcanonical, canonical, and grand canonical ensembles; concepts of work, heat, and temperature; equations of state; heat capacity; equipartition theorem; engines; laws of thermodynamics; non-equilibrium systems; Maxwell-Boltzmann distribution; enthalpy and free energies.

Prerequisite(s): Physics 325; and one of Applied Mathematics 219 or Mathematics 253 or 267 or 277.

Note: Prior completion of or concurrent registration in Physics 341 is highly recommended.

Physics 451 **3 units; H(3-0)**

Statistical Mechanics II
Gibbs' paradox; bosons and fermions; quantum counting; classical-quantum transition; blackbody radiation; phase transitions; fluctuations and critical phenomena; complex systems; self-organized criticality; cellular automata.

Prerequisite(s): Physics 449.

Physics 455 **3 units; H(3-0)**

Electromagnetic Theory II
Macroscopic Maxwell equations. Scalar and vector potentials. Electrostatics and magnetostatics. Dielectric and magnetic properties of materials. Superconductors.

Prerequisite(s): Physics 255 or 323; and Applied Mathematics 309 or Mathematics 353 or 377.

Antirequisite(s): Credit for Physics 455 and Electrical Engineering 475 will not be allowed.

Note: Prior completion of or concurrent registration in Applied Mathematics 433 is highly recommended.

Physics 457 **3 units; H(3-0)**

Electromagnetic Theory III
Electromagnetic wave solutions to Maxwell's equations, in vacuum and in insulating and conducting media. Waveguides. Electromagnetic radiation from accelerated charges. Relativistic formulation of electrodynamics.

Prerequisite(s): Physics 455 and Applied Mathematics 433.

Antirequisite(s): Credit for Physics 457 and Electrical Engineering 476 will not be allowed.

Physics 481 **3 units; H(1-3)**

Computational Physics II
Solution of problems associated with the analysis of physical systems, using digital computers, high level programming languages, and mathematical computation systems.

Prerequisite(s): Physics 381; and one of Physics 325 or Chemistry 373.

Note: Prior completion of or concurrent registration in Physics 443 is highly recommended.

Physics 497 **3 units; H(2-6)**

Applied Physics Laboratory II
Intermediate laboratory electronics. AC circuit theory and semiconductor devices, including operational amplifiers. Digital sampling theory and frequency-domain signal processing. Computer automation of experimental control, data collection, and analysis, including error analysis and error propagation.

Prerequisite(s): Physics 397.

Physics 501 **3 units; H(3-0)**

Special Relativity
Lorentz transformations in classical mechanics; relativistic kinematics; spacetime diagrams; relativistic energy and momentum conservation; Geometrical interpretation; applications of relativistic kinematics; four-vector formalism and tensors; applications, primarily to relativistic electrodynamics.

Prerequisite(s): Physics 325 and 457; and one of Mathematics 353 or 377 or Applied Mathematics 309.

Physics 507 **3 units; H(3-0)**

Solid State Physics
Crystal structure. Classification of solids and their bonding. Fermi surface. Elastic, electric and magnetic properties of solids.

Prerequisite(s): Physics 443 or Chemistry 373; and Physics 449 and 455.

Physics 509 **3 units; H(3-0)**

Plasma Physics
Occurrence of plasmas in nature, single particle motion, plasmas as fluids, waves in plasmas, diffusion, resistivity, equilibrium and stability, kinetic theory of plasmas, non-linear effects.

Prerequisite(s): Physics 343 and 455.

Physics 521 **3 units; H(3-0)**

Non-linear Dynamics and Chaos
Introduction to non-linear dynamical systems: Phase space representation, bifurcations, normal forms, non-linear oscillators, deterministic chaos, attractors, fractals, universality, renormalization, and synchronization.

Prerequisite(s): Applied Mathematics 433 and Physics 381 and 449.

Physics 543 **3 units; H(3-0)**

Quantum Mechanics II
Theory of angular momentum and applications, perturbation theory and applications. Identical particles. Introduction to relativistic wave equations.

Prerequisite(s): Physics 443 or Chemistry 373.

Physics 561 **3 units; H(3-1)**

Stable and Radioactive Isotope Studies, Fundamentals
A multidisciplinary course. Topics include nucleosynthesis, radioactive decay, isotope exchange phenomena, kinetic isotope effects, tracer techniques, molecular spectra and instrumentation.

Prerequisite(s): Consent of the Department.

Physics 575 **3 units; H(3-3)**

Optics
Geometrical Optics: lenses, mirrors, and other basic optical components. Matrix Methods. Physical Optics: Interference, Diffraction, and Polarization.

Fourier Optics. Modern Optics: Lasers and Fibre Optics.

Prerequisite(s): Physics 325, 457 and Applied Mathematics 433.

Antirequisite(s): Credit for Physics 575 and 471 will not be allowed.

Physics 581 **3 units; H(1-3)**
(formerly Physics 535)

Computational Physics III
Solution of problems associated with the analysis of physical systems, using digital computers, high level programming languages, and mathematical computation systems (e.g., Maple, Macsyma).

Prerequisite(s): Physics 443 or Chemistry 373; and Physics 481 and 455.

Note: A knowledge of a high level programming language (C, C++, Fortran or Pascal) is highly recommended.

Physics 593 **3 units; H(3-0) or H(0-6)**

Topics in Contemporary Physics
Topics will be from the research areas of staff members.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Physics 597 **3 units; H(1-6)**

Senior Physics Laboratory
Selected advanced experiments. Where possible, students may choose those experiments most suited to their interests. Development of technical and computer-based skills, technical writing and presentation skills.

Prerequisite(s): Physics 325 and 497.

Physics 598 **6 units; F(0-9)**

Honours Research Thesis
Each student will be assigned a project in consultation with a supervisor. Written reports and oral presentations are required.

Prerequisite(s): Physics 443 and 449 and 455 and consent of the Department.

Physics 599 **3 units; H(0-9)**

Senior Research Thesis
Each student will be assigned a project in consultation with a supervisor. Written reports and oral presentations are required.

Prerequisite(s): Consent of the Department.

Note: This course may be repeated once for credit.

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Physics 603 **3 units; H(3-0)**

Experimental Methods of Physics
Instrumentation for physical experiments. General philosophy of experimentation; signal processes; signal processing methods; instrument design and control; data acquisition and storage; specific detection methods.

Physics 605 **3 units; H(3-0)**

Advanced Data Analysis
Methods of extraction of significant information from experimental data degraded by noise. Parametric and non-parametric statistical methods; curve fitting; spectral analysis; filtering, sampling, convolution and deconvolution techniques.

Physics 609 **3 units; H(3-0)**

Advanced Classical Mechanics
Variational principles, Lagrange's equations, Noether's theorem. Hamilton's equations and canonical transformations. Hamilton-Jacobi theory, action-angle variables. Perturbation theory.

Note: It is expected that a student's background will include Physics 343 or equivalent.

Physics 611 **3 units; H(3-0)**

Statistical Physics
Classical and quantum ensemble theory applied to interacting systems: real gases, spin lattices, phase transitions. Kinetic theory: Boltzmann equation, transport processes, irreversible processes and fluctuations.

Note: It is expected that a student's background will include Physics 449 or equivalent.

Physics 613 **3 units; H(3-0)**

Electrodynamics
Interaction between charged particles and the electromagnetic field in relativistic formulation. Scattering and energy losses of charged particles. Radiation by charged particles.

Note: It is expected that a student's background will include Physics 457 and 501 or equivalents.

Physics 615 **3 units; H(3-0)**

Advanced Quantum Mechanics I
Formalism of quantum mechanics. Entangled systems and their applications. Quantum nonlocality, Einstein-Podolsky-Rosen paradox, Bell theorem. Interpretations of quantum mechanics. Second quantization. Quantum theory of the electromagnetic field. Addition of angular momenta, Clebsch-Gordan coefficients, Wigner-Eckart theorem.

Note: It is expected that a student's background will include Physics 543 or equivalent.

Physics 617 **3 units; H(3-0)**

Advanced Quantum Mechanics II
Relativistic quantum mechanics. Topics may include Feynman path integrals. Scattering theory. Charged particles in electric and magnetic fields. Approximation methods. Quantum field theory.

Note: It is expected that a student's background will include Physics 543 or equivalent.

Physics 619 **3 units; H(3-0)**

Statistical Physics II
Topics Theories of equilibrium and non-equilibrium critical phenomena and methods to study fluctuating systems selected from the following list of topics: Percolation, scaling theory, phase transitions, Landau-Ginzburg theory, lattice models, Monte Carlo methods, renormalization group, self-organized criticality, theory of random graphs; Brownian motion, random walks and diffusion, Fokker-Planck-Equation, Markov processes, stochastic differential equations, first passage times.

Prerequisite(s): Physics 611.

Note: It is expected that a student's background will include Physics 481 or its equivalent.

Physics 621 **3 units; H(3-0)**

Nonlinear Dynamics and Pattern Formation
Topics: Introduction to pattern formation and self-organization in nature: Reaction-diffusion systems, hydrodynamical systems, bistable media, excitable and oscillatory media, stability analysis, bifurcations, pattern selection, amplitude equations and normal forms, fronts, traveling waves, topological defects, spiral waves, spatiotemporal chaos, defect-mediated turbulence, spatiotemporal point processes

Note: It is expected that a student's background will include Physics 451, 481 and 521 or equivalents.

Physics 629 **3 units; H(3-0)**

Gravitation
An introduction to Einstein's theory of gravitation. Applications to the solar system, black holes, and cosmology.

Note: It is expected that a student's background will include Physics 501 or equivalent.

Physics 663 **3 units; H(2-1)**
(Geology 663)

Applications of Stable Isotopes
Application of stable isotope techniques with special focus on Hydrogeology, Geology and Environmental Sciences. The use of isotopes to understand the water, carbon, nitrogen and sulphur cycles is demonstrated. Topics include hydrology, paleoclimates, geothermometry, fossil fuels exploration and recovery, pollutant tracing, food webs, forensic investigations, among others.

Prerequisite(s): Consent of the Department.

Physics 671 **3 units; H(3-0)**

Atomic and Molecular Spectroscopy
Atomic structure and spectra. Rotational, vibrational and electronic spectra of diatomic molecules, including microwave, infrared, Raman and visible/ultraviolet spectroscopic techniques. Hund's coupling cases. Polyatomic molecular spectroscopy. Examples from astronomy and upper atmosphere/space physics.

Physics 673 **3 units; H(3-0)**

Quantum and Non-linear Optics
Theory of dispersion. Fast and slow light. Basics of nonlinear optics. Nonlinear optical crystals, phase matching. Coherence theory. Preparation, manipulation and measurement of quantum optical states and single-photon qubits. Elements of atomic physics, optical Bloch equation, rotating-wave approximation. Two-and three-level systems. Cavity quantum electrodynamics.

Physics 675 **3 units; H(3-0)**

Special Topics in Laser and Optical Sciences
Lectures by Physics and Astronomy, Chemistry, Engineering, and/or Medicine staff on current research topics in laser science and modern optical techniques.

MAY BE REPEATED FOR CREDIT

Physics 677 **3 units; H(3-0)**

Implementations of Quantum Information
Proposals and realizations of quantum information tasks including quantum computation, quantum communication, and quantum cryptography in optical, atomic, molecular, and solid state systems.

Prerequisite(s): Consent of the Department.

Physics 691 **1.5 units; Q(2S-0)**

Scientific Communication Skills
Required, multi-component, program of courses for all graduate students in the Department of Physics and Astronomy designed to assist students in improving their scientific oral and written communication skills. Each student must complete a minimum of three terms of Physics 691 during each graduate course, although the normal load is four terms, and additional terms may be required

of students on an as-need basis. The components of Physics 691 are:

691.11. Effective Scientific Speaking for MSc Students

691.12. Graduate Seminar for MSc Students I

691.13. Effective Scientific Writing for MSc Students

691.14. Graduate Seminar for MSc Students II

691.16. Graduate Seminar for MSc Students III

691.18. Graduate Seminar for MSc Students IV

691.21. Effective Scientific Speaking for PhD Students

691.22. Graduate Seminar for PhD Students I

691.23. Effective Scientific Writing for PhD Students

691.24. Graduate Seminar for PhD Students II

691.26. Graduate Seminar for PhD Students III

691.28. Graduate Seminar for PhD Students IV

Effective Scientific Speaking courses provide instruction on preparing and presenting quality scientific oral presentations, including discussions of the aspects of quality presentations and exercises aimed at improving student speaking skills, and will be taken by graduate students in their first fall terms in program. Effective Scientific Writing courses provide students with instruction on preparing quality scientific papers, as well as exercises aimed at improving students' writing skills, and will be taken during students' second fall term in program. The Graduate Seminar courses will be run each winter, and provide all students enrolled in each course the opportunity to present one or two scientific talks, as well as to provide peer feedback to other students in the course. At the end of each Graduate Seminar term, the course instructor(s) will identify those students who have reached an acceptable level of scientific speaking competency and exempt these students from any further Physics 691 Graduate Seminar courses for their current degrees.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Physics 697 **3 units; H(3-0) or H(0-6)**

Topics in Contemporary Physics
Topics will be from the research areas of staff members.

MAY BE REPEATED FOR CREDIT

Physics 699 **3 units; H(0-9)**

Project in Physics
Each student will select a project in consultation with a staff member. The project may be experimental or theoretical in nature. A written report and an oral presentation are required.

Physics 701 **3 units; H(0-9)**

Independent Study
Each student will select a topic of study in consultation with a staff member. The topic will be in the research area of the staff member. This course may not be used to meet the regular course requirements in the MSc and PhD programs.

MAY BE REPEATED FOR CREDIT

Plant Biology PLBI

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.

Senior Courses

Plant Biology 327 (formerly Botany 327) **3 units; H(3-3)**

Systematics and Diversity of Plants
The diversity, form and function of plants ranging from algae, bryophytes (non-vascular land plants) and psilophytes to the angiosperms. Examples chosen to understand the origin of land plants and their subsequent evolution leading to highly diversified flowering plants.

Prerequisite(s): Biology 371 or 233 or any two of Biology 231, 233, 241 and 243 and 57 units (9.5 full-course equivalents).

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Plant Biology 401 (formerly Botany 401) **3 units; H(3-0)**

Plant Biotechnology
The theory, application and history of plant biotechnology. Plant genome structure and the regulation of gene expression. Transcript, protein and metabolic profiling. Recombinant gene transfer into the plant genome. Biotechnological approaches to crop improvement, soil remediation and value-added traits.

Prerequisite(s): Biology 331, 371 or 233 and one of Biochemistry 341 or 393.

Plant Biology 403 (formerly Botany 303) **3 units; H(3-3)**

Plant Physiology
An integrative examination of the major physiological and metabolic processes in plants from the cellular to the whole-plant level. Emphasis on internal and external controls of growth and development; photosynthesis; nutrient assimilation; plant hormone metabolism and action; and stress physiology.

Prerequisite(s): Biology 371 or 233 or any two of Biology 231, 241, and 243 and 57 units (9.5 full-course equivalents).

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Plant Biology 421 (formerly Botany 321) **3 units; H(3-3)**

Plant Anatomy
The cell, tissue, and organ systems of vascular plants, with special reference to angiosperms, meristems, differentiation, and aspects of plant tissue development. An introduction to plant microtechnique.

Prerequisite(s): Biology 371 or 233 or any two of Biology 231, 241, and 243 and 57 units (9.5 full-course equivalents).

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Plant Biology 507 (formerly Botany 507) **3 units; H(0-8) or H(3-0)**

Special Problems in Plant Biology
Research or reading project that may include seminars, lectures, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 54 units (9.0 full-course equivalents) and consent of the Department.

Note: Students completing a typical course sequence in their program would normally be eligible to enrol in their 3rd or 4th year. After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

MAY BE REPEATED FOR CREDIT

Plant Biology 528 (formerly Botany 528) **6 units; F(0-8)**

Independent Studies in Plant Biology
Original and independent thought, practical research and the completion of written and oral reports.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a departmental faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be signed by the course supervisor before a student can register.

MAY BE REPEATED FOR CREDIT

Plant Biology 530 (formerly Botany 530) **6 units; F(0-8)**

Honours Research Project in Plant Biology
Research project under the direction of one or more faculty members in the Department of Biological Sciences. Formal written and oral reports must be presented on completion of this course. Open only to Honours Botany students or Honours Biological Sciences students.

Prerequisite(s): 90 units (15 full-course equivalents) and consent of the Department.

Note: After consultation with a department faculty member who will supervise the chosen problem, a permission form obtained from the department office or website must be completed before a student can register.

Plant Biology 541 (formerly Botany 541) **3 units; H(3-3)**

Taxonomy of the Seed Plants
A study of plants in relation to classification, phylogeny, evolution and identification. Students are required to make a plant collection of fifty plant specimens for identification in the laboratory. It is recommended that the collection be made in the preceding summer.

Prerequisite(s): Botany 327 or Plant Biology 327.

Plant Biology 543 (formerly Botany 543) **3 units; H(3-3)**

Plant Cell and Developmental Biology
Physiology, biochemistry, molecular and cellular aspects of plant growth and development. Emphasis on the co-ordinated regulation of gene expression, cell-cell communication, and signalling during development. Discussion on the methods used to study development, such as mutants of Arabidopsis and other model systems.

Prerequisite(s): Biology 331 and one of Botany 303 or 321 or Plant Biology 403 or 421.

Note: Offered during odd-even dated academic years. Enrolment in this course may be limited. See

Program Details in the Faculty of Science section of this Calendar.

Graduate Courses

Enrolment in any graduate course requires consent of the Department. Only when appropriate to a student's program may graduate credit be received for courses numbered 500-599. 600-level courses are available with permission to undergraduate students in the final year of their programs.

Plant Biology 633 **3 units; H(3-0)**

Current Topics in Plant Biology
Lectures, discussions and student seminars on topics of current interest in plant biology. Topics will include functional genomics, advances in forward and reverse genetics, hormone signaling, plant-microbe and plant-environment interactions.

Note: Senior undergraduate students in the Botany program are strongly encouraged to register in this course.

MAY BE REPEATED FOR CREDIT

Plant Biology 645 **3 units; H(3-2S)**
(formerly Botany 645)

Dynamic Aspects of Plant Ultrastructure
The ultrastructural and functional aspects of the cell, tissue, and organ systems of vascular plants. Analysis and interpretation of electron micrographs. Seminars on recent research development.

Note: Offered during even-odd dated academic years.

Plant Biology 745 **3 units; H(0-6)**
(formerly Botany 745)

Plant Biology Microtechniques
Principles and practice of preparation of plant tissues for light microscope study. Plastic embedding techniques, histochemistry, immunohistochemistry, quantitative cytochemistry, fluorescence microscopy, confocal laser scanning microscopy and photomicroscopy are included.

Note: Offered during odd-even dated academic years.

Political Science POLI

Instruction offered by members of the Department of Political Science in the Faculty of Arts.

Political Science Table of Principal Fields

For use in selecting courses to meet principal field requirements:

Canadian Politics	Comparative Politics	International Relations	Political Theory	Other
321	279	283	213	201
343	359	381	310	357
425	369	435	406	399
426	371	439	407	415
427	417	475	408	451
428	424	479	409	502
431	429	483	411	590
432	430	485	413	591
444	433	487	503	597
445	447	491	505	599
521	453	523	515	
525	455	543		
531	463	575		
541	464	581		
551	465	585		
	469	587		
	470			
	471			
	473			
	477			
	554			
	561			
	569			
	571			
	577			
	579			

Political Science 302 and 402 will be designated as Canadian Politics, Comparative Politics, International Relations, Political Theory and Other depending on the topic covered.

Junior Courses

Political Science 201 **3 units; H(3-1T)**

Introduction to Government and Politics
A systematic introduction to the basic concepts and institutions of the process of politics.

Political Science 213 **3 units; H(3-0)**

Political Ideologies
An introduction to the study of political ideologies such as nationalism, socialism, liberalism and fascism.

Political Science 279 **3 units; H(3-0)**

Politics of the Global South
An introduction to political issues common to the developing regions of Africa, Asia, Latin America and the Middle East, with special emphasis on topics such as democratization, globalization, development, and human rights.

Political Science 283 **3 units; H(3-0)**

Issues and Trends in World Politics
Major trends and issues in world politics, such as international tensions, migration, ethnic conflicts, human rights and sustainable development.

Senior Courses

In selecting senior courses and in designing their programs, students are advised to consult the Undergraduate Guide, available from the Department.

Political Science 302 **3 units; H(3-0)**

Selected Topics in Politics
Content of the course will vary. Consult the Department for information on topics.

MAY BE REPEATED FOR CREDIT

Political Science 310 **6 units; F(3-0)**

History of Political Thought
An introduction to some of the most profound attempts to think about the meaning, limits, and possibilities of political life through an examination of selected central texts within the history of Western political philosophy.

Political Science 321 **3 units; H(3-1T)**

Politics and Government in Canada
An examination of institutions and political processes in Canada. Significant attention is paid to key institutions such as Parliament, the executive, federalism, the Constitution, and the courts. Emphasis is also placed on the way that political processes are shaped by these and other institutions. This course may have a special instructional format. Please consult the Department for details.

Political Science 343 **3 units; H(3-1T)**

Law, Politics, and the Judicial Process
The judicial system as a branch of government and as part of the political process. Focus on the Canadian judiciary within a comparative context.

Political Science 357 **3 units; H(3-0)**

Introduction to Public Policy Analysis
An introduction to themes and methods in public policy studies. The practical and normative problems facing governments in initiating, formulating, enacting, and implementing policy will be discussed. May include case studies.

Political Science 359 **3 units; H(3-0)**

Introduction to Comparative Politics
An introduction to the central concepts, problems, and approaches that comprise the field of comparative politics. Emphasis may also be placed on key analytical challenges, competing methods, and basic governance systems in selected parts of the world.

Political Science 369 **3 units; H(3-0)**

Governments and Politics of the Middle East
A survey and analysis of the organization and functioning of governments and politics of the contemporary Middle East, with emphasis on the social and economic environments which influence them.

Political Science 371 **3 units; H(3-0)**

Governments and Politics of Africa
Political institutions of selected African states. The influence of class and tribal structure; political parties; elections, the source and nature of ideologies; and economic and social policies.

Political Science 381 **3 units; H(3-0)**

Introduction to International Relations
The structures and processes of international relations and foreign policy.

Political Science 399 **3 units; H(3-1T)**

Quantitative Research Methods
Quantitative research design, measurement, data collection, and data analysis.

Antirequisite(s): Credit towards degree requirements will be given for only one of Engineering 319, Political Science 399, Psychology 312, Sociology 311, 315, Statistics 205, 213, 217, 327; that one being a course appropriate to the degree program.

Note: The Department recommends that this course precede 400- and 500-level courses in Political Science.

400- and 500-Level Courses

Please consult the Schedule of Classes regarding availability of the following 400- and 500-level courses:

Political Science 402 **3 units; H(3-0)**

Selected Topics in Politics
Content of the course will vary. Consult the Department for information on topics.

Prerequisite(s): 3 units in Political Science at the senior level.

MAY BE REPEATED FOR CREDIT

Political Science 406 **3 units; H(3-0)**

Greek Love and Wisdom
A study of Ancient Greek attempts to address the relationship between love, sex, marriage, friendship, and how we might best lead our lives in a political community. Works by Aristophanes, Plato, Xenophon, Aristotle, Plutarch and others may be covered.

Prerequisite(s): Political Science 310.

Political Science 407 **3 units; H(3-0)**

Classical Political Thought
An examination of selected classical texts from historians, dramatists and political philosophers with special focus upon the concepts relevant to political problems in the twentieth century.

Prerequisite(s): Political Science 310.

Political Science 408 **3 units; H(3-0)**

Modern Freedom and Morality
A study of attempts to locate the limits of freedom and the demands of morality for embodied beings within seventeenth to nineteenth century political thought. Works by Rousseau, Kant, J.S. Mill, and others may be covered.

Prerequisite(s): Political Science 310.

Political Science 409 **3 units; H(3-0)**

Modern Political Thought
A study of selected thinkers and themes within the history of political thought important for our understanding of modernity.

Prerequisite(s): Political Science 310.

Political Science 411 **3 units; H(3-0)**

Recent Political Thought
A study of selected twentieth- and twenty-first century political thinkers and their critics. Consult the department for information on the selection of topics.

Prerequisite(s): Political Science 310.

Political Science 413 **3 units; H(3-0)**

Politics and Literature
Political analysis of how selected works of literature articulate visions of order and disorder.

Prerequisite(s): Political Science 310.

Political Science 415 **3 units; H(3-0)**

Politics through Film
An examination of the complex relationship between politics and film, through selected fictional and documentary works.

Prerequisite(s): 3 units in Political Science.

Political Science 417 **3 units; H(3-0)**

Feminist Political Theory
A comparative and critical survey of the main contemporary feminist approaches to political theory: this may include liberal feminism, radical/cultural feminism, socialist/Marxist feminism, and postmodern/postcolonial feminism.

Prerequisite(s): Political Science 310 or 453.

Political Science 424 **3 units; H(3-0)**

Indigenous Politics
An introduction to historical and contemporary socio-political issues associated with indigenous peoples and state-society relations.

Prerequisite(s): 3 units in Political Science.

Political Science 425 **3 units; H(3-0)**

City Government
A study of both institutions and political processes relating to city politics.

Prerequisite(s): Political Science 321.

Political Science 426 **3 units; H(3-0)**
(formerly Political Science 325)

Federalism
Theoretical and empirical examination of federalism in Canada and other selected states.

Prerequisite(s): Political Science 321.

Political Science 427 **3 units; H(3-0)**

Government and Politics of Alberta
An analysis of the institutions and processes of Alberta's government as well as activities in selected policy areas. The examination will include historical as well as contemporary references.

Prerequisite(s): Political Science 321.

Political Science 428 **3 units; H(3-0)**

Comparative Provincial Politics
An analysis of provincial politics in Canada focusing on the distinctive political environments as well as similarities and differences in provincial political cultures, party systems and elections, and selected policy areas.

Prerequisite(s): Political Science 321.

Political Science 429 **3 units; H(3-0)**

Electoral Behaviour
An examination of how and why citizens engage with their governments. Topics may include individual and group influences on citizen participation, electoral choice, and political behaviour in Canada and other democracies.

Prerequisite(s): One of Political Science 321 or 399.

Political Science 430 **3 units; H(3-0)**

Public Opinion
An investigation of theories of public opinion in representative democracies and of survey techniques employed in their examination. A portion of the course will normally be devoted to developing and administering a public opinion survey. Computer use and quantitative analysis are required.

Prerequisite(s): Political Science 399.

Political Science 431 **3 units; H(3-0)**

Canadian Political Parties
An examination of political parties and party systems in Canada. Party history is reviewed and attention is given to issues relating to organization, finance, representation and electoral competition.

Prerequisite(s): Political Science 321.

Political Science 432 **3 units; H(3-0)**

Selecting and Removing Political Leaders
An examination of the processes political parties use to choose and remove their leaders. The focus is on Canadian parties with comparisons to selected parties in other countries.

Prerequisite(s): Political Science 321.

Political Science 433 **3 units; H(3-0)**

Cities and Multilevel Government
Theoretical and empirical examination of multi-level governance with a specific focus on cities. Emphasis on the creation and modification of multi-level governance systems, as well as the consequences of multi-level governance for public policy, political authority, and democratic accountability.

Prerequisite(s): 3 units in Political Science at the senior level.

Political Science 435 **3 units; H(3-0)**

Canada and World Politics
An analysis and evaluation of Canada's role on the international scene; main objectives of Canadian foreign policy; security and defence policies; Canada's participation in universal international organizations; the influence of Canada as a middle power upon world events.

Prerequisite(s): Political Science 381.

Political Science 439 **3 units; H(3-0)**

Strategic Studies
An analysis of the causes of war, the meaning of security and defence in the post-Cold War era, including the use and control of military force.

Prerequisite(s): Political Science 381.

Political Science 444 **3 units; H(3-0)**

Constitutional Law and Politics
The law and politics of the Canadian constitution, including the Charter of Rights and Freedoms, the federal division of powers, and responsible parliamentary government.

Prerequisite(s): Political Science 321 and 343.

Antirequisite(s): Credit for Political Science 444 and either 442 or 445 will not be allowed.

Political Science 447 **3 units; H(3-0)**

Comparative Public Policy
An examination of a range of public policy issues from a comparative perspective. Topics include social policy, family policy, immigration and multiculturalism, and environmental policy across the advanced industrialized democracies.

Prerequisite(s): Political Science 357 or 359.

Political Science 451 **3 units; H(3-0)**

Public Administration
Theories of public administration and their practical application in Canada and selected countries.

Prerequisite(s): Political Science 321.

Political Science 453 **3 units; H(3-0)**
(formerly Political Science 553)

Women and Politics
An examination of current trends in women's political participation in Canada and around the world. Topics may include: women's political behaviour, women's political representation, and women's movements' engagement with political institutions.

Prerequisite(s): Political Science 359 or 321.

Political Science 455 **3 units; H(3-0)**

Protest, Rebellion, and Revolution
A study of the origins, processes, and outcomes of peaceful and violent forms of political protest, rebellion and revolution. Cases may include historical and contemporary examples from around the world.

Prerequisite(s): Political Science 359.

Political Science 463 **3 units; H(3-0)**

Politics of Post Industrial States
Comparative analysis of the political dynamics of post-industrial states. Focus on problems associated with post-industrialization and on explanations for political stability and change.

Prerequisite(s): Political Science 359.

Political Science 464 **3 units; H(3-0)**

European Politics
An introduction to the governments and politics of the states and societies of Europe, including the importance of their membership in the European Union.

Prerequisite(s): Political Science 359.

Political Science 465 **3 units; H(3-0)**

Chinese Politics
An introduction to the politics of the Chinese communist party-state. Topics may include: the Mao era leadership debates on socialist development; the post-Mao reforms of Deng Xiaoping and his successors; and the emerging challenges associated with market reforms and China's integration into the global capitalist economy.

Prerequisite(s): Political Science 359.

Political Science 469 **3 units; H(3-0)**

Middle East: Contemporary Political Problems
An in-depth analysis of selected political, economic and social problems and issues affecting individual nations and the area in general.

Prerequisite(s): Political Science 369.

Political Science 470 **3 units; H(3-0)**

Genocide, Justice, and Reconciliation
An introduction to comparative genocide studies. Examines various cases of genocide and mass violence as well as the problems of justice and reconciliation in post-genocide societies.

Prerequisite(s): One of Political Science 359 or 381 or Law and Society 201.

Political Science 471 **3 units; H(3-0)**

Africa: Contemporary Political Problems
An analysis of political problems in selected political systems of Africa. Topics will include the politics of rural development, political elites and the state in Africa, political institutions, constraints on development, and urban politics.

Prerequisite(s): Political Science 371 or African Studies 301.

Political Science 473 **3 units; H(3-0)**

States Regimes Latin America
An analysis of how selected Latin American states and societies are addressing both old and new problems such as the transitions from and legacies of dictatorship, political and criminal violence, as well as the construction of democratic institutions and inclusive citizenship.

Prerequisite(s): Political Science 359.

Political Science 477 **3 units; H(3-0)**
(formerly Political Science 377)

American Politics
A study of the institutions and processes of American politics.

Prerequisite(s): Political Science 359.

Political Science 479 **3 units; H(3-0)**

International Relations of the Contemporary Arab World
An examination of the Arab regional system, with emphasis on regional interaction, regional organizations, and external linkages. The specific cultural, political, ideological, and strategic characteristics of the system will be analyzed.

Prerequisite(s): Political Science 369.

Political Science 483 **3 units; H(3-0)**
(formerly Political Science 383)

International Law
The basic concepts, principles, and functions of international law.

Prerequisite(s): Political Science 381.

Political Science 485 **3 units; H(3-0)**

Global Political Economy
Analysis of the politics of international economic relations. Topics may include the politics of trade and money relations, energy, multinational corporations, and the New International Economic Order.

Prerequisite(s): Political Science 381.

Political Science 487 **3 units; H(3-0)**
(formerly Political Science 385)

International Organizations
An analysis of international governmental organizations with main emphasis on the United Nations and selected regional organizations.

Prerequisite(s): Political Science 381.

Political Science 491 **3 units; H(3-0)**

U.S. Security Policy
Examination of U.S. security policy, with emphasis on how it is made and on contemporary security issues the U.S. faces.

Prerequisite(s): Political Science 381.

Political Science 502 **3 units; H(3-0)**

Selected Topics in Politics
Content of the course will vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Political Science 503 **3 units; H(3-0)**

Selected Topics in Political Theory
Content of the course will vary from year to year. Consult the Department for information on choice of topics.

Prerequisite(s): Political Science 310.

Political Science 505 **3 units; H(3S-0)**

Sexual Ethics
An examination of attempts to theorize those things associated with human sexuality using works of historical and contemporary political philosophy. Topics may include: the nature of love and friendship, the good of marriage, limits of sexuality, and the place of justice, equality, and shame.

Prerequisite(s): Political Science 310.

Political Science 515 **3 units; H(3S-0)**

Advanced History of Political Thought
An intensive study of selected major political thinkers within the history of political thought.

Prerequisite(s): Political Science 310.

Political Science 521 **3 units; H(3S-0)**

Canadian Federalism
An examination of the dynamics of Canadian Federalism including relations among provinces and between provinces and the federal government.

Prerequisite(s): Any of the following courses: Political Science 321, 426, 427, or 428.

Political Science 523 **3 units; H(3S-0)**

Canada and the Circumpolar World
An examination of critical national and international issues in the circumpolar world.

Prerequisite(s): Political Science 381.

Political Science 525 **3 units; H(3-0)**

Energy Politics in Alberta
An examination of energy politics in Alberta. Topics may include the federal-provincial dimensions of energy politics and policymaking, environmental politics, and the economic dimensions of energy policy.

Prerequisite(s): Political Science 321.

Political Science 531 **3 units; H(3-0)**

Parties, Elections and Representation
An examination of political parties and elections in both established and emerging democracies as a means of understanding the nature of political representation in modern representative democracies.

Prerequisite(s): Political Science 431.

Political Science 541 **3 units; H(3-0)**

Selected Topics in Public Law
An examination of the political, philosophical, and institutional dimensions of selected public law issues. Civil liberties issues will be emphasized, but other questions may also be studied. Consult the Department for information on choice of topics.

Prerequisite(s): Political Science 444 or 445.

Political Science 543 **3 units; H(3-0)**

Law and Armed Conflict
An examination of key texts and topics concerning the evolution, conceptualization, codification, and practical application of the laws of armed conflict. Topics may include the historical and philosophical development of the customary and codified laws of armed conflict, military law and military training and education, and the use of law to punish and deter war crimes.

Prerequisite(s): Political Science 343 or 483.

Political Science 551 **3 units; H(3-0)**
(History 551)

Women in Canadian Politics
A political history of women in Canada in the twentieth and twenty first centuries. Topics include campaigns for suffrage, legal personhood and equality rights, women's political activism, the evolution of public policy concerning women, and the participation of women in public life.

Prerequisite(s): Political Science 321.

Political Science 554 **3 units; H(3S-0)**

Women and Public Policy
An examination of the impact of public policies on gender relations from a comparative perspective. Topics may include family and social policies, gender and the workplace, reproductive rights, and gender-based violence.

Prerequisite(s): Political Science 357, 359, or 453.

Political Science 561 **3 units; H(3S-0)**

Government and Politics of the European Union
An examination of the politics of the European Union. May be offered as a seminar or in preparation for and participation in a model European Council Meeting.

Prerequisite(s): One of Political Science 359, 381, or 464.

Political Science 569 **3 units; H(3S-0)**

Selected Topics in Middle East Politics
Emphasis will be on foreign-policy development and application in the Middle East.

Prerequisite(s): Political Science 369 and one 400-level course in comparative politics or international relations.

Political Science 571 **3 units; H(3-0)**

The Politics of Human Rights
An advanced introduction to the principal advances and debates in the field of human rights politics over the past half century.

Prerequisite(s): Political Science 310, 359, or 381 and one 400-level Political Science course.

Political Science 575 **3 units; H(3-0)**

Intelligence and Policy
An examination of the role and limits of intelligence in policymaking.

Prerequisite(s): Political Science 381.

Political Science 577 **3 units; H(3S-0)**

Advanced American Politics
Domestic political issues in American politics including political parties, courts, Congressional-Presidential relations, and budgetary, fiscal and social relations. May be offered as a simulation.

Prerequisite(s): Political Science 477.

Political Science 579 **3 units; H(3-0)**

Political Economy of Development
Third World development projects, programs, and policies in Africa, Asia and Latin America, intended to raise the standard of living and enhance political participation.

Prerequisite(s): Consent of the Department.

Political Science 581 **3 units; H(3S-0)**

Selected Topics in International Law and Organizations
An advanced seminar on international order and on co-operative and competitive efforts by states and other international actors to create, maintain and change that order.

Prerequisite(s): Political Science 483 or 487.

Political Science 585 **3 units; H(3-0)**

Nonproliferation Regimes
An analysis of the politics of the international regimes governing the control of weapons of mass destruction, including case studies of states that pose challenges to these regimes.

Prerequisite(s): Political Science 381.

Political Science 587 **3 units; H(3-0)**

International Ethics
An examination of ethical reasoning and moral norms in political decision making, institutions, and processes in international politics. Topics such as justice in relation to war and terrorism, sovereignty, intervention and human rights, globalization and global poverty, and the environment may be analyzed.

Prerequisite(s): Political Science 381 or 310.

Political Science 590 **3 units; H(3-0)**
(formerly Political Science 499)

Honours Seminar
An examination of classic works in political science.

Prerequisite(s): Admission to Political Science Honours program.

Note: Normally students take this in the first half (Fall Term) of their final year.

Political Science 591 **3 units; H(3-0)**
(formerly Political Science 500 and 504)

Honours Thesis
For students in the last year of their Honours program.

Prerequisite(s): Political Science 590 and admission to the Political Science Honours program.

Note: Normally, Honours students write their thesis during the second half (Winter Term) of their final year.

Political Science 597 **3 units; H(3-0)**

Directed Readings in Political Science
Students wishing to register in this course must submit to the Head of the Department a detailed statement by the instructor of the work to be carried out.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Political Science 599 **3 units; H(3-0)**

Qualitative Research Methods
An introduction to qualitative research methods in Political Science. Topics may include qualitative methodology, elite interviewing, focus groups, content analysis, case studies and qualitative data analysis.

Prerequisite(s): 3 units in Political Science.

Graduate Courses

Courses numbered 600-799 are offered either as special reading courses or as seminars, as required. Students should consult the Department regarding enrolment in these courses.

Political Science 605 **3 units; H(3S-0)**

Advanced Introduction to Sexual Ethics
An advanced introduction to theorizing human sexuality using works of historical and contemporary political philosophy. Topics may include: the nature of love and friendship, the good of marriage, limits of sexuality, and the place of justice, equality, and shame.

Antirequisite(s): Credit for Political Science 605 and 505 will not be allowed.

Political Science 615 **3 units; H(3S-0)**

Advanced History of Political Thought
An intensive study of selected major political thinkers within the history of political thought.

Political Science 617 **3 units; H(3-0)**

Advanced Political Theory
Discussion of contemporary topics in political thought. Emphasis on analysis of problems rather than history of ideas.

Political Science 619 **3 units; H(3-0)**

War and Interpretation
An examination of the philosophical justifications offered to defend the use of military force, based particularly on the analysis of texts in the history of Western political philosophy.

Political Science 621 **3 units; H(3-0)**

Canadian Political Institutions
Examination of the structure and operation of the central institutions of the Canadian state, including the constitution, federalism, parliamentary government, and political parties.

Political Science 623 **3 units; H(3-0)**

Canadian Political Process
Examination of Canadian political behaviour within its institutional context, including political parties, interest groups, voting and socialization. Computer use is optional.

Political Science 631 **3 units; H(3-0)**

Parties, Elections and Representation
An examination of political parties and elections in both established and emerging democracies as a means of understanding the nature of political representation in modern representative democracies.

Political Science 633 **3 units; H(3S-0)**

U.S. Security Policy
An examination of U.S. security policy, with an emphasis both on how U.S. security policy is made and on the main contemporary security issues the U.S. faces today.

Political Science 641 **3 units; H(3-0)**

Selected Topics in Public Law
Examination of the political, philosophical, and institutional dimensions of selected public law issues, with particular reference to judicial and quasi-judicial tribunals as policy-making institutions. Consult the Department for information on choice of topics.

Political Science 643 **3 units; H(3-0)**

Law and Armed Conflict
An examination of key texts and topics concerning the evolution, conceptualization, codification, and practical application of the laws of armed conflict. Topics may include the historical and philosophical development of the customary and codified laws of armed conflict, military law and military training and education, and the use of law to punish and deter war crimes.

Political Science 651 **3 units; H(3-0)**

Policy Studies
Critical review of major themes, issues, and approaches in the study and evaluation of public policy.

Political Science 653 **3 units; H(3-0)**

Gender and Public Policy
Explores the gendered impact of a range of public policies and also explores the influence of gender norms and ideas on the formulation of public policy. Topics covered include gender-based policy analysis, gender and the welfare state, family and child-care policies, policies to address gender inequalities in the labour market and workplace, and reproductive rights policies.

Political Science 671 **3 units; H(3-0)**

Advanced Comparative Politics: Political Development
Analysis of comparative methods and paradigms of political development.

Political Science 673 **3 units; H(3-0)**

Advanced Comparative Politics: Institutions and Systems
Comparative analysis of political institutions and systems.

Political Science 675 **3 units; H(3-0)**

Selected Topics in Advanced Comparative Politics
Selected regions and topics in Comparative Politics.

MAY BE REPEATED FOR CREDIT

Political Science 681 **3 units; H(3-0)**

Advanced Analysis of International Relations
Selected issues and approaches in the analysis of world politics.

Political Science 683 **3 units; H(3-0)**

Advanced Studies in Foreign Policy
Selected themes in the formation and implementation of foreign policies.

Political Science 684 **3 units; H(3-0)**

Human Rights and Humanitarianism
An advanced introduction to the principal contemporary debates in the field of human rights and humanitarian politics.

Antirequisite(s): Credit for Political Science 684 and 571 will not be allowed.

Political Science 685 **3 units; H(3-0)**

Strategic Studies
Advanced seminar in major topics in strategic studies, such as arms control, deterrence, and other military doctrines.

Political Science 687 **3 units; H(3S-0)**

Advanced Studies in Canadian Arctic Security
The Canadian Arctic is an emerging area of concern due to changes scarcely imaginable even a few years ago. Examines the nature of some of these changes—e.g., climate change and the northern seas' dramatically changing ice conditions, growing recognition of the regions' resource wealth, and evolving international relations in the circumpolar region—and what they mean for Canadian Arctic security.

Antirequisite(s): Credit for Political Science 687 and 523 will not be allowed.

Political Science 689 **3 units; H(3-0)**

Unconventional Warfare
Analysis of warfare conducted by, or against, substate groups. This may include in-depth studies of guerrilla warfare, asymmetric conflict, or terrorism.

Political Science 691 **3 units; H(3-1)**

Quantitative Analysis in Political Science
Examination of empirical research methods and techniques of quantitative analysis in the study of political phenomena. Computer use is required.

Political Science 693 **3 units; H(3-0)**

Advanced Quantitative Analysis in Political Science
Examination of advanced empirical research methods and techniques of multivariate quantitative analysis in the study of political phenomena.

Prerequisite(s): Political Science 691.

Political Science 699 **3 units; H(3-0)**

Qualitative Analysis in Political Science
An introduction to qualitative research methods in Political Science. Topics may include qualitative methodology, elite interviewing, focus groups, content analysis, case studies and qualitative data analysis.

Prerequisite(s): Political Science 691.

Political Science 715 **3 units; H(3-0)**

Special Topics in Political Theory
MAY BE REPEATED FOR CREDIT

Political Science 721 **3 units; H(3-0)**

Special Topics in Canadian Politics
MAY BE REPEATED FOR CREDIT

Political Science 723 **3 units; H(3-0)**

Special Topics in Political Science
MAY BE REPEATED FOR CREDIT

Political Science 725 **3 units; H(3-0)**

Special Topics in Public Administration
MAY BE REPEATED FOR CREDIT

Political Science 741 **3 units; H(3-0)**

Special Topics in Public Law
MAY BE REPEATED FOR CREDIT

Political Science 755 **3 units; H(3-0)**

Special Topics in Public Policy
MAY BE REPEATED FOR CREDIT

Political Science 781 **3 units; H(3-0)**

Special Topics in International Relations
MAY BE REPEATED FOR CREDIT

Political Science 791 **3 units; H(3-0)**

Scope and Methods in Political Science
Advanced seminar covering various approaches, topics, methods and theories employed in the discipline of political science.

MAY BE REPEATED FOR CREDIT

Each year, depending on the needs of students, a number of 600- and 700-level graduate courses are offered from the foregoing list. In addition to the numbered and titled courses shown above, the Department offers a selection of advanced level graduate courses specifically designed to meet the needs of individuals or small groups of students. These courses are numbered in the series 800.01 to 899.99. Such offerings are, however, contingent upon the availability of staff resources.

Psychology PSYC

Instruction offered by members of the Department of Psychology in the Faculty of Arts.

Junior Courses

Psychology 200 **3 units; H(3-0)**

Principles of Psychology I
Designed for Psychology Majors. Fundamental terminology, procedures, findings, and theories related to basic psychological processes. Normally followed by Psychology 201. Psychology 200 is a prerequisite for almost all senior-level Psychology courses.

Antirequisite(s): Credit for Psychology 200 and 205 will not be allowed.

Psychology 201 **3 units; H(3-0)**

Principles of Psychology II
Designed for Psychology Majors. Fundamental terminology, procedures, findings, and theories related to individual, social, and abnormal behaviour. Psychology 201 is a prerequisite for most senior-level Psychology courses.

Prerequisite(s): Psychology 200.

Antirequisite(s): Credit for Psychology 201 and 205 will not be allowed.

Psychology 203 **3 units; H(3-0)**

Psychology for Everyday Life
Designed for non-Psychology majors. Provides students with an understanding of the key theories, research methods, and discoveries of psychology, with an emphasis on developing the knowledge and skills necessary to be effective consumers of psychological theory and research. Through a focus upon issues that arise in everyday life, this course will demonstrate some of the ways in which psychology can be of use to students in their personal and professional lives.

Psychology 204 **3 units; H(3-0)**

Human Sexuality
Examination of contemporary knowledge and attitudes toward human sexuality, relying on theoretical and empirical psychological research. Multiple perspectives are presented, including psychosocial, cross-cultural, and psychobiological. Sexuality across the life span is examined, including issues pertaining to sexual differentiation, intimacy and communication, gender role development, varieties of sexual relationships and behaviour, and legal and ethical issues.

Senior Courses

Note: Registration in 400- and 500-level Psychology courses is restricted to Psychology Majors.

Psychology 305 **3 units; H(3-0)**

History of Psychological Thought
The roots of psychological thought in Western culture, and the relationship between theories of human nature and changing social institutions.

Prerequisite(s): Psychology 200 and 201.

Psychology 312 **6 units; F(3-2)**

Experimental Design and Quantitative Methods for Psychology
An integrated approach to the methods, principles, and ethics of psychological research and the

statistical techniques utilized for the analysis of these data.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 or Mathematics 31 or Mathematics II (offered by Continuing Education) or 50 per cent or higher on the Mathematics Diagnostic Test (offered by the Mathematics and Statistics Department), and Psychology 200.

Antirequisite(s): Credit towards degree requirements will be given for only one of Psychology 312 and Engineering 319, Political Science 399, Sociology 311, Statistics 205, 213, 217, 327; that one being a course appropriate to the degree program.

Note: This course serves as a prerequisite for all 400- and 500-level Psychology courses (except Psychology 405).

Psychology 321 **3 units; H(3-0)**

Industrial and Organizational Psychology
Understanding and predicting behaviour and attitudes within an organizational setting. Topics normally include: personnel selection, attraction to organizations and job choice, person-organization fit, organizational culture, motivation and decision-making, employee attitudes, deviant behaviour in organizations, leadership, team behaviour, and personality in the workplace.

Prerequisite(s): Psychology 200 and 201.

Antirequisite(s): Credit for Psychology 321 and either 421 and 423 will not be allowed.

Psychology 330 **3 units; H(3-0)**

Health Psychology
Health psychology involves the discipline and principles of psychology and human behaviour in understanding how the mind, body, and behaviour interact in health and disease. Class topics include psychosocial models of health and disease, stress and coping, health enhancing and health damaging behaviours, pain management, and a variety of specific behaviour-related medical illnesses (e.g., heart disease, cancer, insomnia).

Prerequisite(s): Psychology 200 and 201.

Antirequisite(s): Credit for Psychology 330 and 437 will not be allowed.

Psychology 345 **3 units; H(3-0)**

Social Psychology
Social psychological approaches to understanding social influence, social perception and cognition, attitudes and group dynamics.

Prerequisite(s): Psychology 200 and 201.

Antirequisite(s): Credit for Psychology 345 and Sociology 341 will not be allowed.

Psychology 349 **3 units; H(3-0)**

Language Development
Language acquisition is one of the hallmarks of human development. This course will focus on language development in typically developing children, with consideration of environmental and other factors that influence acquisition. Consideration will also be given to atypical language development, which can provide additional insights into the acquisition process. The research methods used to explore language development will be examined.

Prerequisite(s): Psychology 200 and 201.

Antirequisite(s): Credit for Psychology 349 and Linguistics 331 will not be allowed.

Psychology 351 **3 units; H(3-0)**

Developmental Psychology
An examination of psychological development through childhood and adolescence.

Prerequisite(s): Psychology 200 and 201.

Antirequisite(s): Credit for Psychology 351 and either Applied Psychology 311 or 313 will not be allowed.

Psychology 353 **3 units; H(3-0)**

Psychology of Aging
Examines theory and research related to psychological processes during adulthood and aging. Topics may include life-span developmental theories and methods; biological processes; sensory, perceptual and cognitive processes; personality and social processes; life transitions, mental health issues; and dying.

Prerequisite(s): Psychology 200 and 201.

Psychology 365 **3 units; H(3-0)**

Cognitive Psychology
A survey of research and theory in cognitive psychology. Research in pattern recognition, attention, memory, language, thinking, and other cognitive abilities is explored, with discussion of associated brain mechanisms.

Prerequisite(s): Psychology 200 and 201.

Antirequisite(s): Credit for Psychology 365 and Applied Psychology 411 will not be allowed.

Psychology 369 **3 units; H(3-0)**

Sensation and Perception
The psychological and physiological bases of sensory and perceptual processes, including vision, audition, taste, smell, touch, proprioception, and basic psychophysics. Provides a background for advanced courses in sensory and perceptual processing, human factors, and environmental psychology.

Prerequisite(s): Psychology 200 and 201.

Psychology 375 **3 units; H(3-0)**

Brain and Behaviour
The neural basis of learning, memory, language and thinking, as well as pathological, sexual, aggressive, and emotional behaviour that arises from neural and hormonal malfunctioning.

Prerequisite(s): Psychology 200.

Antirequisite(s): Credit for Psychology 375 and 371 will not be allowed.

Psychology 383 **3 units; H(3-0)**

Personality
Approaches to the study of personality.

Prerequisite(s): Psychology 200 and 201.

Psychology 385 **3 units; H(3-0)**

Abnormal Psychology
Abnormal behaviour and experiences, their causes and treatment throughout the lifespan.

Prerequisite(s): Psychology 200 and 201.

Psychology 405 **3 units; H(3-0)**

Contemporary Theories in Psychology
An analysis of what constitutes a "theory," "model" and "explanation" in psychology as a science. Survey of major theoretical positions in twentieth-century psychology.

Prerequisite(s): Psychology 200 and 201, one senior course in Psychology, and admission to the Psychology major or Honours program.

Psychology 407 **3 units; H(3-2)**

Psychometrics
Theory and application of methodological and statistical issues in psychological assessment. Topics include: theories of psychological measurement, scale development, item analysis, item bias, reliability, validity, and test fairness.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Antirequisite(s): Credit for Psychology 407 and Applied Psychology 307 will not be allowed.

Psychology 411 **3 units; H(3-2)**

Design and Analysis in Psychological Research
Experimental design problems and techniques for analysis of psychological data.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Psychology 415 **3 units; H(3-2)**

Qualitative Inquiry in Psychology
Qualitative approaches to psychological research such as phenomenology, grounded theory, and discourse analysis. Specific topics include research interviews, ethics, and evaluating qualitative research.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Psychology 417 **3 units; H(3-2)**

Tests and Individual Differences
Individual differences and psychological testing including the description, use, evaluation and development of typical tests, as well as discussion of important issues in human difference.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Psychology 425 **3 units; H(3-2)**

Human Factors
Application of psychological research and theory to people-system relationships and the work environment; display and control devices, design and evaluation of the built environment, human skills and limitations, work schedules, safety, and research methods in human factors engineering.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Psychology 427 **3 units; H(3-2)**

Environmental Psychology
The theory and data pertaining to the relationship between human behaviour and the physical environment, both natural and built. Particular emphasis is placed on the implications of current knowledge for the management of the human-environment interface. A research project is an integral part of the course.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Psychology 429 **3 units; H(3-2)**

Adolescence
An in-depth examination of the physical, cognitive, emotional, and social changes occurring during

adolescence, drawing upon theory and relevant research.

Prerequisite(s): Psychology 312, 351 and admission to the Psychology major or Honours program.

Antirequisite(s): Credit for Psychology 429 and 355 will not be allowed.

Psychology 430 **3 units; H(3-2)**

Psychophysiology in Health Research
An examination of the impact of emotions on physiological activity and risk for disease, including coronary heart disease, ulcers, asthma, cancer and other immune-related disorders, with an emphasis on the discussion and understanding of empirical research. Hands-on experience with psychophysiological measurement equipment and procedures commonly used in stress research will be provided.

Prerequisite(s): Psychology 312, 330 or 437 and admission to the Psychology major or Honours program.

Psychology 431 **3 units; H(3-0)**

Current Issues in Psychopathology
Discussion of current developments and controversies in the assessment, etiology, and treatment of psychopathology. Emphasis will be on teaching students how to strengthen their critical thinking skills using controversial issues in the fields of abnormal and clinical psychology as a basis for discussion and debate.

Prerequisite(s): Psychology 312, 385 and admission to the Psychology major or Honours program.

Psychology 433 **3 units; H(3-2)**

Clinical Psychology
Assessment and treatment problems in clinical settings.

Prerequisite(s): Psychology 312, 385 and admission to the Psychology major or Honours program.

Psychology 435 **3 units; H(3-2)**

Behaviour Modification
Current behaviour change procedures for children and adults. Practical considerations involved in the selection, implementation, maintenance, and evaluation of behaviour modification programs.

Prerequisite(s): Psychology 312, 385 and admission to the Psychology major or Honours program.

Psychology 439 **3 units; H(3-0)**

Psychology of Gender
An analysis of psychological theory and research on gender situated within the interdisciplinary field of gender studies. Topics include the meaning of gender, psychological development and gender, and gender and interpersonal relationships.

Prerequisite(s): Psychology 312, one of 345 or 351, and admission to the Psychology major or Honours program.

Antirequisite(s): Credit for Psychology 439 and 347 will not be allowed.

Psychology 441 **3 units; H(3-2)**

Social Psychology: Theory and Research
A review of current theory and research in the area of social psychology. Research projects will introduce methodologies used in this area.

Prerequisite(s): Psychology 312, 345 and admission to the Psychology major or Honours program.

Psychology 443 **3 units; H(3-0)**

Interpersonal Relationships
Application of social psychological theory and methodology to a variety of topics in the area of interpersonal relationships such as attraction, close relationships, interpersonal conflict, communication, and power. Course projects will be an integral part of the course.

Prerequisite(s): Psychology 312, 345 and admission to the Psychology major or Honours program.

Psychology 445 **3 units; H(3-0)**

Psychology of Morality
An exploration of the origins and nature of moral conduct from the perspective of psychological theory and research. Examination of the naturalistic basis for why people care about morality, behave morally or not, and the psychological bases of moral judgment. Topics may include the evolutionary basis for morality, moral intuitionism, moral development, and moral judgment.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Antirequisite(s): Credit for Psychology 445 and 447.08 will not be allowed.

Psychology 447 **3 units; H(3-0)**

Advanced Topics in Personality or Social Psychology
An examination of current research topics in personality or social psychology or gender.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Note: Students are advised to consult with the Department regarding the topic and recommended prerequisites for the course in a given term.

MAY BE REPEATED FOR CREDIT

Psychology 449 **3 units; H(3-2)**

Social-Personality Development
Socialization processes and behaviours from birth to adolescence; observational learning, altruism, moral development, sex-roles, dependency, emotional development, and social motivation.

Prerequisite(s): Psychology 312, 351 and admission to the Psychology major or Honours program.

Psychology 451 **3 units; H(3-2)**

Cognitive Development
Current and classic research in the area of cognitive development is explored. Topics may include sensory and perceptual development, language acquisition, symbolic representation, concept formation, memory, and social-cognitive development. Laboratory projects introduce methodologies used in research with children.

Prerequisite(s): Psychology 312, 351 and admission to the Psychology major or Honours program or to the minor in Speech-Language Sciences for Linguistics Majors.

Psychology 455 **3 units; H(3-0)**

Sensory, Perceptual, and Cognitive Aspects of Aging
Basic research and contemporary issues in the age-related changes in sensation, perception, attention, learning and memory, intelligence and problem-solving.

Prerequisite(s): Psychology 312, 353 and admission to the Psychology major or Honours program.

Psychology 457 **3 units; H(3-0)**

Social and Clinical Aspects of Aging
Stability and change in the later years of life with a focus on social and clinical areas of aging.

Prerequisite(s): Psychology 312, 353 and admission to the Psychology major or Honours program.

Psychology 459 **3 units; H(3-0)**

Developmental Psychopathology
A critical examination of developmental psychopathology during childhood and adolescence with an emphasis on the characteristics of the disorders, their determinants, and outcomes. Current theories and research, and recent trends in intervention and prevention will be emphasized.

Prerequisite(s): Psychology 312, 351, 385 and admission to the Psychology major or Honours program.

Psychology 463 **3 units; H(3-2)**

Memory
Current memory research is explored. Topics include how memories are encoded, and retrieved. Laboratory projects introduce methodologies used in memory research.

Prerequisite(s): Psychology 312, 365 and admission to the Psychology major or Honours program.

Psychology 465 **3 units; H(3-2)**

Research in Cognitive Psychology
Current research in human memory, thinking, attention, and language processing is explored. Laboratory projects will introduce research methodologies used in these areas.

Prerequisite(s): Psychology 312, 365 and admission to the Psychology major or Honours program.

Psychology 467 (Linguistics 467) **3 units; H(3-2)**

Experimental Psycholinguistics
Exploration of the cognitive, neuropsychological, and social processes that underlie language abilities, with reference to linguistic theory. A laboratory component provides experience with methodologies used to study language behaviour.

Prerequisite(s): Psychology 312 and admission to the Psychology major or Honours program or to the minor in Speech-Language Sciences for Linguistics Majors.

Antirequisite(s): Credit for Psychology 467 and either Linguistics 339 or 439 will not be allowed.

Psychology 469 **3 units; H(3-2)**

Vision
A systematic examination of vision and its role in our interactions with the natural environment. Topics may include: the physics of light; optics; eye and retina; visual pathways and visual brain; perception of colour, space, change and motion; visual development and aging; art and vision; visual disorders; and recovery from blindness.

Prerequisite(s): Psychology 312, 369 and admission to the Psychology major or Honours program.

Psychology 471 **3 units; H(3-0)**

Auditory Cognitive Neuroscience
Exploration of auditory perception from an auditory cognitive neuroscience perspective, using music and speech as domains of inquiry. Students will learn topics in acoustics, psychophysics, cognitive psychology, cognitive development, neurophysiology, and neuropsychology. Students will also conduct hands-on exercises in sound manipulation and experimentation.

Prerequisite(s): Psychology 312, 369 and admission to the Psychology major or Honours program or to the minor in Speech-Language Sciences for Linguistics Majors.

Psychology 473 **3 units; H(3-0)**

Evolution and Human Behaviour
An examination of the scientific synthesis of evolutionary biology and modern psychology, which offers a novel approach to such issues as short-term and long-term human mating strategies, short-term sexual strategies, conflict between the sexes, parental investment, aggression, and social dominance.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Antirequisite(s): Credit for Psychology 473 and 377 will not be allowed.

Psychology 475 **3 units; H(3-0)**
(Neuroscience 475)

Drugs and Behaviour
The behavioural effects of drugs specifically employed to affect the nervous system, as seen in the treatment of mental disorders, behavioural disorders, and other conditions such as Parkinson's, Huntington's and Alzheimer's diseases. Neuro-pharmacologic agents will be discussed as they relate to the biochemistry and physiology of putative neurotransmitters.

Prerequisite(s): Psychology 312, 375 and admission to the Psychology major or Honours program.

Psychology 477 **3 units; H(3-0)**

Sleep and Biological Rhythms
Behaviours are temporally co-ordinated and occur in a rhythmic fashion. The most obvious rhythmic behaviour humans engage in is sleeping; we spend one-third of our lives asleep. This course will survey the behavioural, physiological, and clinical aspects of sleep and biological rhythms.

Prerequisite(s): Psychology 312, 375 and admission to the Psychology major or Honours program.

Psychology 478 **3 units; H(3-3)**
(Neuroscience 478)

Behavioural Neuroscience
An examination of the neural underpinnings of behaviour. Experimental approaches, neural mechanisms, and health implications will be explored through both lecture material and laboratory exercises.

Prerequisite(s): Psychology 312, 375 and admission to the Psychology major or Honours program.

Psychology 479 **3 units; H(3-2)**
(Neuroscience 479)

Human Neuropsychology
Integration of the literature on human brain damage with the evidence from animal research. Topics include developmental neuropsychology; cognitive deficits associated with frontal, parietooccipital, and temporal lobes; origins and mechanisms in the determination of cerebral dominancy; disorders of learning and memory; long-term effects of cerebral lesions.

Prerequisite(s): Psychology 312, 375 and admission to the Psychology major or Honours program or to the minor in Speech-Language Sciences for Linguistics Majors.

Psychology 481 **3 units; H(3-0)**

Advanced Topics in Organizational Psychology
Students will be expected to critically evaluate current theory, research, and practice in the field of Organizational Psychology with content emphasizing primary readings. Student presentations, project work, and debates will emphasize the implications for linking knowledge and practice.

481.01. Leadership and Motivation

481.02. Teams and Teamwork

481.03. Workplace Attitudes and Individual Differences

Prerequisite(s): Psychology 312, one of 321 or 421 or 423 and admission to the Psychology major or Honours program.

Psychology 483 **3 units; H(3-0)**

Advanced Topics in Personnel Psychology
Students will be expected to critically evaluate current theory, research, and practice in the field of Personnel Psychology with content emphasizing primary readings. Student presentations, project work, and debates will emphasize the implications for linking knowledge and practice.

483.01. Personnel Selection

483.02. Personnel Recruitment and Job Choice

483.03. Performance Management

Prerequisite(s): Psychology 312, one of 321 or 421 or 423 and admission to the Psychology major or Honours program.

Psychology 491 **3 units; H(3-0)**

Cross-Cultural Cognition
Theory and research on the interaction of culture and human cognition. Topics include cross-cultural research in perception, language processing, memory, concepts, and reasoning.

Prerequisite(s): Psychology 312, 365 and admission to the Psychology major or Honours program.

Psychology 493 **3 units; H(3-0)**

Psychology and Law
Consideration of the contributions of psychological theory and research to the understanding of crime investigation, courtroom dynamics, and the legal system. Specific topics may include eyewitness testimony, police practices, judge and jury decision making, lie detection and confessions, and expert testimony. Topics will be discussed from the perspectives of social and cognitive psychology.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Psychology 495 **3 units; H(3-0)**

Consumer Psychology
Consideration of the psychological concepts used to understand the processes involved in consumer behaviour. Specific topics may include research methodology, individual and group influences, marketing strategies, and consumer decision making. Topics will be discussed from the perspectives of cognitive and social psychology.

Prerequisite(s): Psychology 312 and admission to the Psychology major or Honours program.

Antirequisite(s): Credit for Psychology 495 and Marketing 483 will not be allowed.

Psychology 497 **3 units; H(3-0)**

Consciousness
An exploration of the origin, nature, and function of consciousness as informed by research on conscious and unconscious processes, psychological disorders, neuropsychological case studies, consciousness-altering drugs, hypnosis, meditation, state-dependent memory, sleep, and dreams.

Prerequisite(s): Psychology 312, one of 365 or 375 and admission to the Psychology major or Honours program.

Psychology 499 **1.5 units; Q(0-1.5)**

Research Experience in Psychology
Students acquire research experience working under the supervision of a faculty member. Students will be assigned duties that may include literature search, materials preparation, data collection, data organization and management, and data analysis (an average of 6 hours of work per week for 13 weeks).

499.01 Research Experience I

499.02 Research Experience II

Prerequisite(s): Psychology 312, 18 units (3.0 full-course equivalents) in Psychology, admission to the Psychology major or Honours program, and consent of the Department.

Note: An application is required and it is the student's responsibility to find a research supervisor.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 501 **3 units; H(3S-0)**

Special Topics Seminar in Psychology
Selected topics from one or more areas in psychology.

Prerequisite(s): Psychology 200, 201, 312, admission to the Psychology major or Honours program and consent of the Department.

Note: May be repeated once for credit with the consent of the Department. Students should consult the Department concerning topics and recommended preparation for a given term.

Psychology 502 **3 units; H(3-2)**

Selected Topics in Psychology with Lab
Selected topics from one or more areas in psychology.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Note: Students are advised to consult with the Department regarding the topic and recommended preparation for the course in a given term.

MAY BE REPEATED FOR CREDIT

Psychology 503 **3 units; H(3-0)**

Selected Topics in Psychology
Selected topics from one or more areas in psychology.

Prerequisite(s): Psychology 200, 201, 312 and admission to the Psychology major or Honours program.

Note: Students are advised to consult with the Department regarding the topic and recommended prerequisites for the course in a given term.

MAY BE REPEATED FOR CREDIT

Psychology 504 **6 units; F(3-3)**

Research in Psychology
Research project in psychology conducted under the supervision of a faculty member.

Prerequisite(s): Psychology 200, 201, 312, admission to the Psychology major or Honours program and consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 505 **3 units; H(3-3)**

Research in Psychology
Research project in psychology conducted under the supervision of a faculty member.

Prerequisite(s): Psychology 200, 201, 312, admission to the Psychology major or Honours program and consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 521 (Neuroscience 521) **3 units; H(3-0)**

Cognitive and Clinical Neuroscience
An examination of how the human central nervous system controls higher order, complex behaviours. Experimental and clinical evidence for the neurobiological regulation of memory, language, attention, perception and emotion will be evaluated.

Prerequisite(s): Psychology 312, 375 and admission to the Psychology major or Honours program.

Psychology 531 (Neuroscience 531) **3 units; H(3-0)**

Nervous System Development
This course will cover the fundamental principles of the development of nervous systems, integrating anatomical, cellular, molecular, genetic, and behavioural approaches.

Prerequisite(s): Psychology 475 and admission to the Psychology major or Honours program.

Psychology 585 **3 units; H(3-0)**

Advanced Topics in Psychopathology
Examination of assessment, phenomenology, etiology, and/or treatment of common psychological disorders. Course will cover few disorders in greater detail.

Prerequisite(s): Psychology 312, 385, 433 and admission to the Psychology major or Honours program.

Psychology 591 **3 units; H(3-0)**

Advanced Topics in Cognitive Psychology
A detailed examination of current research topics in cognitive psychology. Topics may include one or more of the following: human memory, thinking, attention, language processing, and computer modelling.

Prerequisite(s): Psychology 312, 365 and admission to the Psychology major or Honours program.

MAY BE REPEATED FOR CREDIT

Psychology 598 **6 units; F(3S-6)**

Honours Thesis and Seminar
Research project under the direction of a member of the Department. In the seminar, students will present and discuss their projects and other topics of current relevance.

Prerequisite(s): Admission to the Psychology Honours degree program.

Graduate Courses

Psychology 601 **3 units; H(3-0)**

History and Systems of Psychology
History of psychological concepts in Western culture, major theoretical systems of twentieth century psychology, foundational assumptions of theories in contemporary psychology.

Prerequisite(s): Consent of the Department.

Psychology 607 **3 units; H(3-0)**

Advanced Research Design and Methodology in Psychology
Survey of advanced topics in the conduct of psychological research including issues in philosophy of science; origins of research ideas; validity and reliability; measurement; experimental, quasi-experimental, and non–experimental designs; survey research; specialized methods such as computer simulation, psychophysiological methods, event-sampling, online data collection, and cognitive procedures; and ethics.

Prerequisite(s): Consent of the Department.

Psychology 611 **3 units; H(3-3)**

Advanced Qualitative Inquiry in Psychology
Qualitative research designs and historical research in psychology. Advanced study of selected qualitative approaches in psychology to include research design, methods, and analysis. Specific topics covered include foundations of qualitative research, evaluation and practical techniques including computerized analysis.

Prerequisite(s): Consent of the Department.

Psychology 613 **3 units; H(3-3)**

Signal and Systems Analysis in Behavioural Research
Application of signal and systems analysis to behavioural neuroscience and psychophysics.

Prerequisite(s): Consent of the Department.

Psychology 615 **3 units; H(3-3)**

Analysis of Variance
Applications of the general linear model to research design and analysis. Topics include analysis of variance, regression, and analysis of covariance.

Prerequisite(s): Consent of the Department.

Psychology 617 **3 units; H(3-3)**

Multivariate Data Analysis
Multivariate techniques and design issues, including canonical correlation, discriminant analysis, multivariate analysis of variance, multivariate regression, principal components analysis and factor analysis.

Prerequisite(s): Consent of the Department.

Psychology 619 **3 units; H(3-3)**

Special Topics in the Design of Psychological Research
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 620 **3 units; H(3-0)**

Advanced Topics in Brain and Cognitive Sciences
An advanced survey of some of the fundamental issues and recent developments in the Brain and/or Cognitive Sciences. Topics will vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 630 **3 units; H(3-0)**

Advanced Topics in Social and Theoretical Psychology
An advanced survey of some of the fundamental issues and recent developments in Social and/or Theoretical Psychology. Topics will vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 639 **3 units; H(3-0)**

Advanced Industrial and Organizational Psychology
Application of psychological principles, research and methods relating to human interactions and performance in work settings.

Prerequisite(s): Consent of the Department.

Psychology 641 **3 units; H(3-0)**

Advanced Topics in Health Psychology
Introduces students to current research issues in health psychology. Focuses primarily on issues related to the study of chronic illnesses and evaluates the role of psychological/behavioural factors in: the etiology of disease, disease prevention, adaptation to illness, and disease progression.

MAY BE REPEATED FOR CREDIT

Psychology 650 **6 units; F(1S-0)**

Research Seminar in Clinical Psychology
An introduction to research and design issues in clinical psychology.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

Psychology 651 **3 units; H(3-0)**

Psychopathology
Current theory, issues, and research regarding the epidemiology, etiology, diagnosis, and prognosis of psychopathology. Implications for assessment and treatment.

Psychology 659 **3 units; H(3-0)**

Ethics and Professional Issues in Clinical Psychology
Ethical and legal standards for clinical psychologists. An introduction to professional issues in contemporary clinical practice.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 660 **6 units; F(0-14)**

Summer Practicum in Clinical Psychology
Supervised training experience in an approved clinical setting. Provides exposure to basic issues and techniques in the practice of psychological assessment.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 671 **3 units; H(3-3)**

Psychological Assessment of Adults
An overview of theoretical, professional, and ethical issues in the psychological assessment of adult clinical populations. Instruction in the administration and interpretation of assessment procedures for adults including interviews, behavioural assessments, and selected intellectual and personality tests. Supervised practical experience in the application of adult assessments in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 673 **3 units; H(3-3)**

Psychopathology and Psychological Assessment of Children
An overview of theoretical, professional and ethical issues in the psychopathology and psychological assessment of child clinical populations. Instruction in the administration and interpretation of

child and family assessment procedures including interviews, behavioural assessments, and selected psychological tests. Supervised practical experience in the application of child and family assessments in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 681 **3 units; H(3-3)**

Adult Psychotherapy
Theory, research, and practice in adult psychotherapy and behaviour change. Supervised exposure to the practice of adult psychotherapy in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 683 **3 units; H(3-3)**

Child Psychotherapy
Theory, research, and practice in child and family psychotherapy and behaviour change. Supervised exposure to the practice of child and family psychotherapy in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 700 **3 units; H(3S-0)**

Integrative Seminar in Psychology
Selected interdisciplinary topics in Psychology. Topics will vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 702 **3 units; H(0-3)**

Research in Brain and Cognitive Sciences
Completion of a research project in Brain and/or Cognitive Sciences conducted under the supervision of a faculty member. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 703 **3 units; H(0-3)**

Research in Social and Theoretical Psychology
Completion of a research project in the areas of Social and/or Theoretical Psychology conducted under the supervision of a faculty member. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 709 **3 units; H(0-3)**

Research in Industrial/Organizational Psychology
Completion of a research project in Industrial/Organizational Psychology conducted under the supervision of a faculty member. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 710 **6 units; F(3S-0)**

Integrative Seminar in Psychology
Selected interdisciplinary topics in Psychology. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 712 **6 units; F(0-3)**

Research in Brain and Cognitive Sciences
Completion of a research project in Brain and/or Cognitive Sciences conducted under the supervision of a faculty member. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 713 **6 units; F(0-3)**

Research in Social and Theoretical Psychology
Completion of a research project in the areas of Social and/or Theoretical Psychology conducted under the supervision of a faculty member. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 720 **3 units; H(3S-0)**

Seminar in Brain and Cognitive Sciences
Selected topics in Brain and/or Cognitive Sciences. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 730 **3 units; H(3S-0)**

Seminar in Social and Theoretical Psychology
Selected topics in Social and/or Theoretical Psychology. Topics may vary.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 739 **3 units; H(3S-0)**

Seminar in Industrial/Organizational Psychology
Application of psychological principles and methods to business, industry and other organizational settings.

Prerequisite(s): Psychology 639.

MAY BE REPEATED FOR CREDIT

Psychology 750 **1.5 units; Q(3S-0)**

Advanced Seminar in Clinical Psychology
A doctoral level seminar in advanced topics in the practice of clinical psychology.

750.01. Psychopharmacology

750.02. Neuropsychology

750.05. Diversity Issues in Clinical Psychology

750.06. Clinical Geropsychology

750.09. Addictions

750.10. Health Psychology

750.11. Eating Disorders

750.12. Consultation/Supervision

Note: Open only to students enrolled in the Clinical Psychology program.

NOT INCLUDED IN GPA

Psychology 751 **3 units; H(3-0)**

Special Topics in Adult Psychopathology
A specialized topic course in the area of adult psychopathology. Course offerings will vary from year to year and may include such topics as: schizophrenia, substance abuse, suicide, mental health delivery systems, or computer applications in clinical psychology.

MAY BE REPEATED FOR CREDIT

Psychology 760 **6 units; F(1-7)**

Specialty Practicum in Clinical Psychology I
Supervised training experience in an approved clinical setting. Provides in-depth exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

NOT INCLUDED IN GPA

Psychology 762 **6 units; F(1-7)**

Specialty Practicum in Clinical Psychology II
Supervised training experience in an approved clinical setting. Provides advanced in-depth exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 765 **3 units; H(1-7)**

Practicum in Clinical Psychology
Supervised training experience in an approved clinical setting. Provides exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 798

Pre-Doctoral Internship in Clinical Psychology
A full calendar year, full-time (or two-years, half-time) supervised training experience in an approved clinical setting. Intensive exposure to various professional issues, the opportunity to work with a diverse range of clinical populations and problems, and advanced training in the use of specific psychological assessment and intervention strategies.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Public Policy PPOL

Instruction offered by members of the School of Public Policy and individual faculties.

Public Policy 601 **3 units; H(3-0)**

Foundations I
This preparatory course covers the foundations necessary to understand and apply economic analysis and it covers selected topics relevant to the core courses listed below.

NOT INCLUDED IN GPA

Public Policy 603 **3 units; H(3-0)**

Foundations II
This preparatory course covers the foundations of basic empirical analysis, including quantitative and qualitative research methods.

NOT INCLUDED IN GPA

Public Policy 605 **3 units; H(3-0)**

Markets and Public Policy
The role of markets in the allocation of resources and the determination of income. Sources of market failure, and the appropriate public policy response to those failures, are examined. Students learn how private firms make decisions, and how they respond to policy initiatives.

Public Policy 607 **3 units; H(3-0)**

Politics and Collective Choice
How public policy issues emerge and how they are developed, refined, and influenced by the political process. The roles and influences of NGOs, interest groups, the media, political parties, and social protest on the development of new public policies are examined from the perspective of several disciplines. The importance of agenda setting, management and planning, policy reform and the organizational resistance to change is examined. Models of rational actors and bureaucratic behaviour are explored.

Public Policy 609 **3 units; H(3-0)**

Decision Analysis
The focus is on the foundations, applications and use of quantitative methods commonly used in decision making in the public and private sectors. Included are methods such as impact analysis, cost-benefit analysis, surveys, game theory and risk management tools.

Public Policy 611 **3 units; H(3-0)**

Independent Study
Supervised individual study in a selected public policy area.

MAY BE REPEATED FOR CREDIT

Public Policy 613 **3 units; H(3-0)**

Effective Writing and Research Skills
Development of skills for writing high quality documents in a professional setting. Defining, designing and executing applied, policy-oriented research.

Public Policy 615 **3 units; H(3-0)**

Public Finances
An overview of government finances and the restrictions on policy choices resulting from the need for governments to satisfy a budget constraint. Tax policy, the appropriate design of expenditure policies, policies with respect to deficits and debt, and issues of intergovernmental relations will be examined.

Public Policy 617 **3 units; H(3-0)**

Regulation and the Law
The role of international and national legal institutions in determining public policy choices. Legal research and interpretation skills are developed through specific public policy issues such as the design of market regulation in telecommunications, energy and various utility markets.

Public Policy 619 **3 units; H(3-0)**

Governance, Institutions and Public Policy
An examination of the rules and informal relationships among those determining public policy outcomes. Alternative institutional relationships and the evolution of those relationships are studied. The ever-changing dynamic of multi-level governance and court versus legislative public policy making are explored.

Public Policy 621 **3 units; H(3-0)**

Communicating Policy
Examines all aspects of communication in the context of policy, including the impact of new modes of communication on the development and dissemination of public policy. The new role of blogs, online communities, and web-based media at marshalling and influencing public opinion and the changing role of print media are discussed and evaluated. Implications for copyright policies, media concentration, privacy, and advertising are among the issues examined.

Public Policy 623 **3 units; H(9-0)**

Capstone Project
Students learn methods by which research contributes to the design and development of policy outcomes. Students are required to apply the skills they have learned to the completion of a capstone project which investigates a well-defined issue of public policy. The final product of the capstone project is expected to be a substantive, well-researched, focused and highly professional document. Work on the capstone project will be guided by a School of Public Policy faculty member and may include input provided by an expert from the private sector or public sector.

MAY BE REPEATED FOR CREDIT

Pure Mathematics PMAT

Instruction offered by members of the Department of Mathematics and Statistics in the Faculty of Science.

Notes:

For listings of related courses, see Actuarial Science, Applied Mathematics, Mathematics, and Statistics.

The following courses, although offered on a regular basis, are not offered every year: Pure Mathematics 415, 423, 425, 427, 505 and 511. Check with the Department office to plan for the upcoming cycle of offered courses.

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 replaces Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

Senior Courses

Pure Mathematics 315 **3 units; H(3-1T)**

Algebra I
Basic ring theory: rings and fields, the integers modulon, Polynomial rings, polynomials over the integers and rationals, homomorphisms, ideals and quotients, principal ideal domains, adjoining the root of an irreducible polynomial; basic group theory: groups, examples including cyclic, symmetric, alternating and dihedral groups, subgroups, cosets and Lagrange's theorem, normal subgroups and quotients, group homomorphisms, the isomorphism theorems, further topics as time permits, e.g., group actions, Cayley's theorem.

Prerequisite(s): Mathematics 211 or 213.

Antirequisite(s): Credit for Pure Mathematics 315 and 317 will not be allowed.

Note: Mathematics 271 or 273 is strongly recommended as preparation for this course.

Pure Mathematics 317 **3 units; H(3-1T)**

Honours Algebra I
Basic ring theory: rings and fields, the integers modulo n, polynomial rings, polynomials over the integers and rationals, homomorphisms, ideals and quotients, principal ideal domains, adjoining the root of an irreducible polynomial; basic group theory: groups, examples including cyclic, symmetric, alternating and dihedral groups, subgroups, cosets and Lagrange's theorem, normal subgroups and quotients, group homomorphisms, the isomorphism theorems, further topics as time permits, e.g., group actions, Cayley's theorem.

Prerequisite(s): Mathematics 213.

Antirequisite(s): Credit for Pure Mathematics 317 and 315 will not be allowed.

Note: Mathematics 271 or 273 is strongly recommended as preparation for this course.

Pure Mathematics 319 **3 units; H(3-1T)**

Transformation Geometry
Geometric transformations in the Euclidean plane. Frieze patterns. Wallpaper patterns. Tessellations.

Prerequisite(s): Mathematics 211 or 213 and one other 200-level course labelled Applied Mathematics, Mathematics or Pure Mathematics, not including Mathematics 205.

Note: Mathematics 271 or 273 is strongly recommended as preparation.

Pure Mathematics 415 **3 units; H(3-0)**

Foundations
Set theory, mathematical logic, category theory, according to interests of students and instructor.

Prerequisite(s): Mathematics 271 or 273 or 311 or 313 or 353 or 367 or 377 or 381 or Pure Mathematics 315 or 317.

Pure Mathematics 418 **3 units; H(3-0)**

Introduction to Cryptography
The basics of cryptography, with emphasis on attaining well-defined and practical notions of security. Symmetric and public-key cryptosystems; one-way and trapdoor functions; mechanisms for data integrity; digital signatures; key management; applications to the design of cryptographic systems. Assessment will primarily focus on mathematical theory and proof-oriented homework problems; additional application programming exercises will be available for extra credit.

Prerequisite(s): One of Mathematics 271 or 273 or Pure Mathematics 315 or 317.

Antirequisite(s): Credit for Pure Mathematics 418 and any of Pure Mathematics 329, Computer Science 418, 429, or 557 will not be allowed.

Pure Mathematics 423 **3 units; H(3-0)**

Differential Geometry
Curvature, connections, parallel transport, Gauss-Bonnet theorem.

Prerequisite(s): Mathematics 353 or 367 or 377 or 381.

Pure Mathematics 425 **3 units; H(3-0)**

Geometry
Euclidean, convex, discrete, synthetic, projective or hyperbolic geometry, according to interests of the instructor.

Prerequisite(s): Pure Mathematics 315 or 317.

Pure Mathematics 427 **3 units; H(3-0)**

Number Theory
Divisibility and the Euclidean algorithm, modular arithmetic and congruences, quadratic reciprocity, arithmetic functions, distribution of primes.

Prerequisite(s): Pure Mathematics 315 or 317.

Pure Mathematics 429 **3 units; H(3-0)**

Cryptography – Design and Analysis of Cryptosystems
Review of basic algorithms and complexity. Designing and attacking public key cryptosystems based on number theory. Basic techniques for primality testing, factoring and extracting discrete logarithms. Elliptic curve cryptography. Additional topics may include knapsack systems, zero knowledge, attacks on hash functions, identity-based cryptography, and quantum cryptography.

Prerequisite(s): Pure Mathematics 315 or 317; and one of Pure Mathematics 329, 418, Computer Science 418.

Pure Mathematics 431 **3 units; H(3-0)**

Algebra II
Group theory: Sylow theorems, solvable, nilpotent and p-groups, simplicity of alternating groups and PSL(n,q), structure theory of finite abelian groups; field theory: gilds, algebraic and transcendental extensions, separability and normality, Galois theory, insolvability of the general quintic equation, computation of Galois groups over the rationals.

Prerequisite(s): Mathematics 311 or 313 and Pure Mathematics 315 or 317.

Pure Mathematics 471 **3 units; H(3-0)**

Combinatorics and Graph Theory
Counting techniques, generating functions, inclusion-exclusion, introduction to graph theory and the theory of relational structures.

Prerequisite(s): Mathematics 271 or 273; and one of Mathematics 249, 251, 265, 275, 281 or Applied Mathematics 217.

Antirequisite(s): Credit for Pure Mathematics 471 and 371 will not be allowed.

Pure Mathematics 503 **3 units; H(3-0)**

Topics in Mathematics
According to interests of students and instructor.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Pure Mathematics 505 **3 units; H(3-0)**

Topology I
Basic point set topology: metric spaces, separation and countability axioms, connectedness and compactness, complete metric spaces, function spaces, homotopy.

Prerequisite(s): Pure Mathematics 435 or 455 or Mathematics 335 or 355.

Pure Mathematics 511 **3 units; H(3-0)**

Algebra III
Linear algebra: Modules, direct sums and free modules, tensor products, linear algebra over modules, finitely generated modules over PIDs, canonical forms, computing invariant factors from presentations; projective, injective and flat modules.

Prerequisite(s): Pure Mathematics 431 or Mathematics 411.

Antirequisite(s): Credit for Pure Mathematics 511 and 611 will not be allowed.

Note: Pure Mathematics 431 is recommended.

Pure Mathematics 513 **3 units; H(3-0)**

Advanced Galois Theory
Existence of separable and algebraic closures of fields, infinite Galois extensions, profinite groups, Krull topology.

Prerequisite(s): Pure Mathematics 431.

Antirequisite(s): Credit for Pure Mathematics 513 and 613 will not be allowed.

Pure Mathematics 527 **3 units; H(3-0)**

Computational Number Theory
An investigation of major problems in computational number theory, with emphasis on practical techniques and their computational complexity. Topics include basic integer arithmetic algorithms, finite fields, primality proving, factoring methods, algorithms in algebraic number fields.

Prerequisite(s): Pure Mathematics 427 or 429.

Antirequisite(s): Credit for Pure Mathematics 527 and 627 will not be allowed.

Pure Mathematics 529 **3 units; H(3-0)**

Advanced Cryptography and Cryptanalysis
Cryptography based on quadratic residuacity. Advanced techniques for factoring and extracting discrete logarithms. Hyperelliptic curve cryptography. Pairings and their applications to cryptography. Code-based and lattice-based cryptography. Additional topics may include provable security, secret sharing, more post-quantum cryptography, and new developments in cryptography.

Prerequisite(s): Pure Mathematics 429.

Antirequisite(s): Credit for Pure Mathematics 529 and 649 will not be allowed.

Pure Mathematics 571 **3 units; H(3-0)**

Discrete Mathematics
Discrete aspects of convex optimization; computational and asymptotic methods; graph theory and the theory of relational structures; according to interests of students and instructor.

Prerequisite(s): Pure Mathematics 471.

Antirequisite(s): Credit for Pure Mathematics 571 and 671 will not be allowed.

Religious Studies RELS

Instruction offered by members of the Department of Classics and Religion in the Faculty of Arts.

Religious Studies Table of Streams

For use in selecting courses to meet stream requirements:

Western Religions	Nature of Religion	Eastern Religions
201	200	203
300	205	303
301	309	307
302	331	310
305	333	312
353	335	313
357	338	314
367	339	316
369	341	317
383	343	319
385	344	320
387	345	322
389	346	323
		324
469	348	
477	349	327
484	363	329
486	381	359
		360
	397	445
	398	451
	417	453
	437	461
	439	Philosophy 335
	440	
	442	
	444	
	447	
	463	
	479	
	Philosophy 331	
	Philosophy 527	
	Greek and Roman Studies 499	

Religious Studies 373, 399, 491, and 595 will be designated as Western, Eastern or Nature of Religion depending on the topic covered. Religious Studies 377, 577, and 590 are not counted in any of the three streams.

Notes:

To request "consent of the Department", students should contact the Department Undergraduate Program Support at clare@ucalgary.ca.

The Department of Classics and Religion Studies' policy is to consider requests for prerequisite waivers no earlier than one month prior to the start of a term.

Junior Courses

Religious Studies 200 **3 units; H(3-0)**

Religious Myths and Worldviews
Readings (in English translation) from the classical literatures of middle Eastern and Asian religions. Introduction to the evolving mythological traditions from three geo-cultural centres (the middle East, India, and China) by examining religious themes: cosmology; existential values and goals; destinies of humans, the world, and the cosmos.

Religious Studies 201 **3 units; H(3-0)**

Jews, Christians and Muslims
Introduction to Judaism, Christianity and Islam.

Religious Studies 203 **3 units; H(3-0)**

Asian Religions
Introduction to Eastern religions such as Jainism, Hinduism, Sikhism, Buddhism, Confucianism and Taoism.

Religious Studies 205 **3 units; H(3-0)**

Religion and The Good Life
An introduction to the academic study of religion with particular emphasis on the nature of religion, its role as a response to existential questions,

and the relationship of religion to contemporary thought and culture.

Antirequisite(s): Credit for Religious Studies 205 and 350 will not be allowed.

Senior Courses

Religious Studies 300 3 units; H(3-0)
(formerly Religious Studies 207)

Classical Hebrew I
Classical or Biblical Hebrew language; the development of ability in the critical reading of ancient texts. No attempt will be made to provide any competence in medieval or modern Hebrew.

Religious Studies 301 3 units; H(3-0)

Studies in the Hebrew Bible/Old Testament
An introduction to the critical study and reading of the books of the Hebrew Bible/Old Testament in English translation. The course focuses on the Bible as religious literature.

Religious Studies 302 3 units; H(3-0)
(formerly Religious Studies 209)

Classical Hebrew II
Continuation of Religious Studies 300.

Prerequisite(s): Religious Studies 300.

Religious Studies 303 3 units; H(3-0)

Introduction to Hinduism
The history, textual traditions, schools and sectarian traditions of Hinduism.

Religious Studies 305 3 units; H(3-0)
(Greek and Roman Studies 305)

Greek Religion
A survey of religious beliefs and practices in the pre-Christian Greek World.

Prerequisite(s): One of Greek and Roman Studies 205, 209, Religious Studies 201, or 205.

Religious Studies 307 3 units; H(3-0)

Popular Hinduism
An introductory survey of the contemporary practices of Hinduism in South Asia and in diaspora Hindu communities throughout the world. Focusing on recent ethnographic research, the course examines the diversity of popular Hindu practices with special attention to differences defined by region, language, caste, and gender. Topics covered will include, but are not limited to, the structure of social and family life, the organization of sacred space and time, ritual practices, and the influence and impact of modernity in Hindu life.

Religious Studies 309 3 units; H(3-0)

Religious Experience
A study of philosophical and psychological theories of the nature and function of religious experiences and an introduction to a variety of religious experiences, which may include theophany, mysticism, enlightenment, conversion, and guilt.

Religious Studies 310 3 units; H(3-0)
(formerly Religious Studies 211)

Sanskrit I
Classical Sanskrit language; the development of ability in the critical reading of ancient Hindu or Buddhist texts.

Religious Studies 312 3 units; H(3-0)
(formerly Religious Studies 213)

Sanskrit II
Continuation of Religious Studies 310.

Prerequisite(s): Religious Studies 310.

Religious Studies 313 3 units; H(3-0)

Introduction to Buddhism
Buddhist developments from the time of Buddha to the development of Mahayana.

Religious Studies 314 3 units; H(3-0)
(formerly Religious Studies 215)

Tibetan I
Classical Tibetan language; the development of ability in the critical reading of ancient Bon and Buddhist texts.

Religious Studies 316 3 units; H(3-0)
(formerly Religious Studies 217)

Tibetan II
Continuation of Religious Studies 314.

Prerequisite(s): Religious Studies 314.

Religious Studies 317 3 units; H(3-0)

Religion in South Asia
An in-depth survey of the religious traditions of the Indian sub-continent. Special attention will be given to the long history of religious pluralism and recent communal conflicts in South Asia. The course will cover religious traditions that have come to South Asia from other parts of the world (primarily Islam, but also Zoroastrianism, Judaism, Christianity and Baha'i).

Religious Studies 319 3 units; H(3-0)

Esoteric Buddhism
The development of Vajrayana, Tantric and other esoteric traditions of Buddhism in India, Tibet, China, Japan and in the West from medieval times to the present.

Religious Studies 320 3 units; H(3-0)
(formerly Religious Studies 219)

Classical Chinese for Religious Texts I
Introduction to Classical Chinese language, with emphasis on developing the ability to read ancient Chinese religious texts.

Religious Studies 322 3 units; H(3-0)
(formerly Religious Studies 221)

Classical Chinese for Religious Texts II
Continuation of Religious Studies 320.

Prerequisite(s): Religious Studies 320.

Religious Studies 323 3 units; H(3-0)

Mahayana Buddhism
Mahayana developments in India, China, Tibet or Japan.

Religious Studies 324 3 units; H(3-0)

Zen Buddhism
An exploration of the thought and practice of Chan (Chinese) and Zen (Japanese) Buddhism, including 20th century developments in the west.

Religious Studies 327 3 units; H(3-0)

Tibetan Religious Traditions
The religious developments in Tibet, with emphasis on religious history, literature and philosophy and their contemporary implications.

Religious Studies 329 3 units; H(3-0)

Buddhism in East Asia
The history, doctrines, literature and leading figures of Buddhism in China and Japan.

Religious Studies 331 3 units; H(3-0)

Religious Perspectives on Suffering
An examination of various religious perspectives on the nature and causes of human suffering.

Religious Studies 333 3 units; H(3-0)

Religious Perspectives on Death and Afterlife
An examination of various religious perspectives on the nature of death and life after death.

Religious Studies 335 3 units; H(3-0)

Ritual and Religion
A major form of religious expression is the various practices and rituals performed by individuals and the community. Various ritual theories and approaches will be examined along with different examples of religious ritual expressions.

Religious Studies 338 3 units; H(3-0)

Atheism
A consideration of various historical and thematic critiques of religion, including the development of modern agnosticism, atheism and in recent times, the 'new atheism'.

Religious Studies 339 3 units; H(3-0)

Transformations of Religion in Africa
Nature of religion through a study of religious transformations in Africa.

Religious Studies 341 3 units; H(3-0)

New Religious Movements
An examination of the beliefs, practices and developments of new religious movements of both Eastern and Western origins (e.g. Krishna Consciousness, Transcendental Meditation, Unification Church, Children of God, etc.).

Religious Studies 343 3 units; H(3-0)

Religion and Social Morality
Critical examination of social theories of religion and religious perspectives on ethical issues of social, economic, and political consequence in contemporary cultures.

Religious Studies 344 3 units; H(3-0)

The Bible as Literature
An exploration of the various literary genres that make up the sixty-six books of the Bible, understood as a compilation of human literature reflecting millennia of communal struggle, vision, and engaged reception.

Religious Studies 345 3 units; H(3-0)

God and Transcendence
Comparative and theoretical discussion of various traditions, Eastern and Western, regarding the object of religious belief and devotion.

Religious Studies 346 3 units; H(3-0)

Chaos, Demons and Monsters
An examination of religious depictions of supernatural evil agents and forces in the light of their role in the experience of good/evil, suffering/happiness, and existence/death.

Religious Studies 348 3 units; H(3-0)

Religion, Empire and Colonialism
An examination of the complex interplay of religious traditions and imperial projects. The development of religion in response to engagement with other cultures, religions and traditions brought on by colonialism, as well as the religious construction and categorization of these others, will be considered through comparative, historical,

literary and/or thematic lenses. Modern responses to colonialism as well as discussions of multiculturalism and immigration may be discussed as they relate to religion.

Religious Studies 349 3 units; H(3-0)

Religion and Politics
A study of the complex relationship between religion and politics, including nationalism and political religions. Topics may include the origin of apartheid in South Africa, Black Theology, the rise of the New Christian Right in America, Hindu and Islamic political movements, and various forms of Fascism including the Nazi movement.

Religious Studies 353 3 units; H(3-0)

Islam in the Modern World
Reform, revivalist and sectarian movements and significant thinkers in Modern Islam.

Religious Studies 357 3 units; H(3-0)

Islam
A survey of the basic religious ideas, texts, figures, and practices in Islam, including their historical development.

Religious Studies 359 3 units; H(3-0)

East Asian Religious Traditions
The history, doctrines and literature of the major religious traditions of China, Korea and Japan.

Religious Studies 360 3 units; H(3-0)

Buddhist Practice Traditions
An introduction to different kinds of meditation practices in Buddhist traditions, through their historical trajectories and their related devotional and ritual aspects. The material is organised according to principal contemporary areas (Vipassana, Chan/Zen/Son, Pureland, Tibetan).

Religious Studies 363 3 units; H(3-0)

Cross-Cultural Philosophy of Religion
Comparative study of philosophical issues of religious interest arising from diverse cultures.

Religious Studies 367 3 units; H(3-0)

Comparative Studies in Western Religions
A comparative and critical examination of a specific topic within Judaism, Christianity, and Islam. Possible topics include: Material Culture, Pilgrimage, and Scriptural Exegesis.

Note: May be counted only twice towards the Major Field requirements in Religious Studies.

MAY BE REPEATED FOR CREDIT

Religious Studies 369 3 units; H(3-0)

Introduction to Judaism
An introduction to the major practices, beliefs, institutions and religious literature of the Jewish religion, as developed from antiquity to modern times.

Religious Studies 373 3 units; H(3-0)

Topics in Religious Studies
Topics may include an overview of a specific religious tradition, an examination of religious expressions in a particular context, a thematic study of a religion or religions, or a methodological approach to the study of religion.

MAY BE REPEATED FOR CREDIT

Religious Studies 377 3 units; H(3-0)

Research and Critical Inquiry in Religious Studies
Systematic instruction in research methods, academic writing, and the practice of critical analysis in the field of Religious Studies. Besides practical instruction, students will be introduced to a variety of methods and theories used in the academic study of religion.

Prerequisite(s): Admission to Religious Studies major or minor.

Religious Studies 381 3 units; H(3-0)

Gender, Sex and Religion
An examination of the complex interrelationship between understandings and constructions of gender, sexuality and Religion as they arise in the context of several religious traditions.

Antirequisite(s): Credit for Religious Studies 381 and 373.09 will not be allowed.

Religious Studies 383 3 units; H(3-0)

From Jesus to Christ: 100 BCE-200 CE
Study of formative Christianity in its political, social and religious contexts with particular attention to its origins within Second Temple Judaism.

Religious Studies 385 3 units; H(3-0)

Paganism and Christianity: 200-800 CE
Examination of social, economic, cultural, religious and political factors that influenced the evolution of early Christian identities as expressed through doctrine, rituals, practices, clerical structures and scripture.

Religious Studies 387 3 units; H(3-0)

Religion in Medieval Europe: 800-1600
An overview of medieval European religious traditions and their mutual development.

Religious Studies 389 3 units; H(3-0)

Modern Christianity: 1600 - Present
An overview of the Christian response to modernity, from the early modern and enlightenment periods through to the contemporary period.

Religious Studies 397 3 units; H(3-0)

Religion and Science
The relationship between religion and science with emphasis on contemporary discussions regarding the intersection of religious thought and theories in the natural sciences.

Religious Studies 398 3 units; H(3-0)

Religion and the Environment
Consideration of issues of public environmental concern from the perspectives of religious studies and ethics. Possible topics include climate change, water depletion, environmental pollution, animal stresses, species/ecosystem decimation, and the climate refugee problem.

Religious Studies 399 3 units; H(3-0)

Religion in Popular Culture
The intersection of religion with popular culture is explored through specific topics.

Note: May be counted only once towards the major field requirements in Religious Studies.

MAY BE REPEATED FOR CREDIT

Religious Studies 417 3 units; H(3-0)

Recent Religious Thought
Detailed examination of a selected writer, topic, or intellectual current in recent religious thought.

Prerequisite(s): 3 units in Nature of Religion at the 300 level (see Table of Streams at beginning of Department offerings).

MAY BE REPEATED FOR CREDIT

Religious Studies 437 3 units; H(3-0)

Hermeneutics
Significance of the hermeneutical tradition for an understanding of religious issues and traditions with attention to the thought of Schleiermacher, Dilthey, Husserl, Heidegger, Gadamer, and Ricoeur among others.

Prerequisite(s): 3 units of Religious Studies at the 300 level.

Religious Studies 439 3 units; H(3-0)

Advanced Studies in New Religious Movements
Detailed study of selected topics in New Religious Movements.

Prerequisite(s): Religious Studies 341.

MAY BE REPEATED FOR CREDIT

Religious Studies 440 3 units; H(3-0)

Religion and Economic Systems
A consideration of the relationship between religious practices and systems of exchange, credit, and economic rationalisation. Historical documents will be used to illustrate the complex nature of religion and economics.

Prerequisite(s): 3 units in Religious Studies at the 300 level.

Religious Studies 444 3 units; H(3-0)

Existentialism
An examination of existentialist thinkers from the nineteenth and twentieth centuries, contextualizing their work within both modernity and theist/atheist discourses.

Prerequisite(s): 3 units of Religious Studies at the 300 level.

Religious Studies 445 3 units; H(3-0)

Advanced Studies in Asian Thought
A critical examination of Asian philosophical and religious thinkers.

Prerequisite(s): Philosophy 335 or 3 units of Religious Studies at the 300 level.

Religious Studies 447 3 units; H(3-0)

Theories of Religion
A critical examination of various theories used in the academic study of religion.

Prerequisite(s): Religious Studies 377 and 3 units of Religious Studies at the 300 level.

Note: Only open to Religious Studies major and Honours students and students registered in combined programs with Religious Studies.

Religious Studies 451 3 units; H(3-0)

Advanced Studies in Hinduism
In-depth study of the historical developments of Hinduism (Vedic, Classical, Medieval, Modern) in a seminar or independent study format.

Prerequisite(s): Religious Studies 303 or 307.

MAY BE REPEATED FOR CREDIT

Religious Studies 453 **3 units; H(3-0)**

Advanced Studies in Buddhism
A seminar course that focuses on selected traditions, or philosophical or historical themes, such as Madhyamaka, Yogacara, T'ien T'ai, Hua Yen, Zen, Pure Land, Nyingma, Kargyud, Abhidharma, Tathagatagarbha, and Dhyana.

Prerequisite(s): One of Religious Studies 313, 319, 323, 327, or 329.

MAY BE REPEATED FOR CREDIT

Religious Studies 461 **3 units; H(3-0)**

Advanced Studies in East Asian Religions
A seminar course that focuses on selected topics related to the Confucian, Daoist, Buddhist, or Shinto traditions in China, Korea and Japan.

Prerequisite(s): Religious Studies 359.

MAY BE REPEATED FOR CREDIT

Religious Studies 463 **3 units; H(3-0)**

Advanced Topics in Cross-Cultural Philosophy of Religion
Advanced comparative study of selected philosophical issues of religious interest arising from diverse cultures.

Prerequisite(s): 3 units of Religious Studies at the 300 level.

MAY BE REPEATED FOR CREDIT

Religious Studies 469 **3 units; H(3-0)**

Advanced Studies in Judaism
Selected topics in Jewish practices, institutions, beliefs and religious literature. Possible topics include: Jewish Movements of the Second Temple Era; Jewish Rituals and Observances; Midrash and Jewish Biblical Interpretation; Law and Religion in Judaism; Jewish Philosophy and Theology; Judaism in the Modern World; Kabbalah and Jewish Mysticism.

Prerequisite(s): Religious Studies 369.

MAY BE REPEATED FOR CREDIT

Religious Studies 473 **3 units; H(3-0)**

Advanced Studies in Islam
Thematic considerations of topics, such as Islamic philosophy, mysticism, theology, or contemporary trends, based on primary sources. Although no knowledge of Arabic is required, students with backgrounds in Arabic will have the option of working with texts in their original languages.

Prerequisite(s): Religious Studies 353 or 357.

MAY BE REPEATED FOR CREDIT

Religious Studies 477 **3 units; H(3-0)**

Further Studies in the Hebrew Bible/Old Testament
Selected readings, in English translation, from the three major divisions (Pentateuch, Prophets, and Writings) of the Hebrew Bible/Old Testament. Covers topics such as creation, miracles in Egypt, ark of the covenant, sacrifice, prophecies of the Bible, and biblical views of death and immortality.

Prerequisite(s): Religious Studies 301.

Religious Studies 479 **3 units; H(3-0)**

Contemporary Issues in Women and Religion
A topical examination of developments in current research in such areas as: gender theory, post-colonialism, philosophy and religion, feminist theology, feminist evaluation of traditional religious structures, or interdisciplinary work in the reconstruction of women's religiosity.

Prerequisite(s): 3 units of Religious Studies at the 300 level.

Religious Studies 484 **3 units; H(3-0)**

Advanced Studies in Christianity
A seminar course examining topics, personalities and movements in Christianity from its origins to its modern and contemporary developments.

Prerequisite(s): One of Religious Studies 383, 385, 387, or 389.

MAY BE REPEATED FOR CREDIT

Religious Studies 491 **3 units; H(3-0)**

Reading Religious Texts in Primary Languages
Study of religious texts in original languages such as Hebrew, Sanskrit, Tibetan, Chinese or Japanese.

Prerequisite(s): One of Religious Studies 302, 312, 316 or 322.

MAY BE REPEATED FOR CREDIT

Religious Studies 577 **3 units; H(3-0)**

Senior Project Seminar
Students will complete an independent research project on a topic within their area of concentration in Religious Studies and present their research in a seminar setting.

Prerequisite(s): Religious Studies 377 and 6 units (1.0 full-course equivalent) of Religious Studies at the 400 or 500 level and admission to the Religious Studies major or minor.

Religious Studies 590 **6 units; F(0-3T)**

Honours Thesis
Students compose a major research paper under the close supervision of a member of the Department and defend the thesis before an examining committee.

Prerequisite(s): Religious Studies 377 and 6 units (1.0 full-course equivalent) of Religious Studies at the 400 or 500 level and admission to the Honours program in Religious Studies or Ancient and Medieval History.

Religious Studies 595 **3 units; H(3T-0)**

Directed Independent Study
Advanced study of a particular topic under the direction of a faculty member. Qualified students will be supervised through a session of independent study.

Prerequisite(s): 9 units (1.5 full-course equivalents) in Religious Studies at the senior level with at least 3 units (0.5 full-course equivalents) at the 400 level or above and consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Religious Studies 601 **3 units; H(3-0)**

Studies in Western Religions
MAY BE REPEATED FOR CREDIT

Religious Studies 603 **3 units; H(3-0)**

Studies in Eastern Religions
MAY BE REPEATED FOR CREDIT

Religious Studies 605 **3 units; H(3-0)**

Studies in the Nature of Religion
MAY BE REPEATED FOR CREDIT

Religious Studies 607 **3 units; H(0-3T)**

Supervised Master's Thesis Inquiry

Religious Studies 609 **3 units; H(3-0)**

Selected Topics on Critical Discourses in the Study of Religion
Selected topics on critical discourses in the study of religion.

MAY BE REPEATED FOR CREDIT

Religious Studies 681 **3 units; H(3-0)**

Specialized Studies in Western Religions
MAY BE REPEATED FOR CREDIT

Religious Studies 683 **3 units; H(3-0)**

Specialized Studies in Eastern Religions
MAY BE REPEATED FOR CREDIT

Religious Studies 685 **3 units; H(3-0)**

Specialized Studies in the Nature of Religion
MAY BE REPEATED FOR CREDIT

Religious Studies 701 **3 units; H(3-0)**

Studies in Western Religions
MAY BE REPEATED FOR CREDIT

Religious Studies 703 **3 units; H(3-0)**

Studies in Eastern Religions
MAY BE REPEATED FOR CREDIT

Religious Studies 705 **3 units; H(3-0)**

Studies in the Nature of Religion
MAY BE REPEATED FOR CREDIT

Religious Studies 707 **3 units; H(3-0)**

PhD Departmental Colloquium
MAY BE REPEATED FOR CREDIT
NOT INCLUDED IN GPA

Religious Studies 709 **3 units; H(3-0)**

Advanced Topics on Critical Discourses in the Study of Religion
Advanced topics on critical discourses in the study of religion.

MAY BE REPEATED FOR CREDIT

Risk Management and Insurance RMIN

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Risk Management and Insurance 317 **3 units; H(3-0)**

Introduction to Risk Management and Insurance
Overview of the risk management process and risk management methods. Examines both business and personal risk management. Covers the basics of property, liability, auto and life insurance.

Prerequisite(s): Admission to the Haskayne School of Business or the Actuarial Science program, and 30 units (5.0 full-course equivalents) including Economics 201.

Risk Management and Insurance 439
3 units; H(3-0)

Protecting your Family and Wealth
Examines the role that life and health insurance plays in securing individuals' financial futures, whether ensuring family security, or preserving the value produced by the time and energy spent building a business. Topics include wealth transfer to the next generation as well as protection of income and assets. The best fit for different types of policies available at different stages in life will also be examined.

Prerequisite(s): Admission to the Haskayne School of Business or the Actuarial Science program, and Finance 317 or Risk Management and Insurance 317.

Risk Management and Insurance 449
3 units; H(3-0)

Employee Benefits and Social Insurance
The nature of employee benefits as a major component of the compensation package. Group life and group health insurance, pensions and other retirement programs, workers' compensation, unemployment insurance, social security and other social insurance plans. Insurer group operations, reinsurance and the legal aspects of employee benefits and social insurance programs.

Prerequisite(s): Admission to the Haskayne School of Business or the Actuarial Science program, and Finance 317 or Risk Management and Insurance 317.

Risk Management and Insurance 459
3 units; H(3-0)

Managing Commercial Property and Liability Risks
Examines risk management for commercial property and liability exposures. The first half of the course focuses on common property loss exposures that firms face and examines methods of handling such risks. The second half focuses on liability exposures of commercial enterprises, including premises and operations liability, product liability, employment practices liability and director's and officers' liability.

Prerequisite(s): Admission to the Haskayne School of Business.

Corequisite(s): Risk Management and Insurance 317.

Risk Management and Insurance 559
3 units; H(3-0)

Selected Topics in Risk Management and Insurance
Combines a fundamental understanding of insurance and risk management with current issues confronting the insurance industry and risk managers.

Prerequisite(s): Admission to the Haskayne School of Business and Risk Management and Insurance 317.

Note: For certain topics, consent of the instructor will be required.

MAY BE REPEATED FOR CREDIT

Risk Management and Insurance 579
3 units; H(3-0)

Advanced Topics in Risk Management and Insurance
A study of the various methods used to finance the operational risks of commercial enterprises. Key topics addressed are: loss forecasting, insurance, alternative risk financing, reinsurance and environmental risk management.

Prerequisite(s): Admission to the Haskayne School of Business and Risk Management and Insurance 317.

Graduate Courses

Risk Management and Insurance 763
3 units; H(3-0)
(formerly Finance 763)

Managing Risks and Disasters
Risk management strategies with emphasis on the management of operational and hazard risks. Topics include risk identification and assessment; organizational responsibility for risk management; risk mitigation; risk financing; crisis management, and business continuity planning.

Prerequisite(s): Consent of the Haskayne School of Business.

Romance Studies ROST

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Arts.

Junior Course

Romance Studies 299 **3 units; H(3-0)**

Topics in Romance Culture
France, Italy and Spain: cultures of the Mediterranean.

Senior Courses

Romance Studies 341 **3 units; H(3-0)**

Italian Literature of the Renaissance
Major authors of the Italian Renaissance whose works have influenced artists and writers in England, France and Spain.

Note: This course is given in English and no knowledge of Italian is required.

Romance Studies 399 **3 units; H(3-0)**

Topics in Romance Languages
Topics in Romance Languages, Literatures and Cultures. Format and content may vary from year to year.

399.02 Landscapes in Mediterranean Literature and Film

Romance Studies 499 **3 units; H(3-0)**

Advanced Topics in Language and Culture
Discussion of selected topics dealing with Romance languages, literatures and cultures. Format and content may vary from year to year.

Prerequisite(s): One of French 227, 317, Italian 303 or Spanish 303.

Note: May be counted as one of the required courses at the 400 level for French and Spanish Majors.

MAY BE REPEATED FOR CREDIT

Russian RUSS

Instruction offered by the Department of Linguistics, Languages, and Culture in the Faculty of Arts. Students are encouraged to consult the Department website (llc.ucalgary.ca/) for more details on course descriptions and titles of decimalized courses.

Notes:

Russian 317, 355 and 451 are given in English and no knowledge of Russian is required. These courses do not count as prerequisites to other senior Russian courses.

Consent of the Department can be received in lieu of a stated prerequisite when equivalent knowledge can be demonstrated.

Junior Courses

Russian 201 **3 units; H(3-0)**

Introductory Russian
Introductory course to Russian in its cultural context. The basic phenomena of Russian, the principles of language learning, strategies for observing and interpreting cultural phenomena.

Russian 209 **3 units; H(3-1)**

Russian I
First semester of a three-semester sequence of four-skills language learning, covering the principal elements of modern Russian

Prerequisite(s): Russian 201 or 205.

Antirequisite(s): Credit for Russian 209 and 203 will not be allowed.

Senior Courses

Russian 301 **3 units; H(3-1)**

Russian II
The second semester of a three-semester sequence of four-skills language learning, covering the principal elements of modern Russian.

Prerequisite(s): Russian 30, 30-3Y, 207 or 209.

Russian 303 **3 units; H(3-1)**

Russian III
The third semester of a three-semester sequence of four-skills language learning, covering the principal elements of modern Russian.

Prerequisite(s): Russian 301.

Russian 317 **3 units; H(3-0)**

Topics in Russian Civilization and Thought
Distinctive features in the development of Russian civilization and thought.

317.01. Multiculturalism, Russian Style

317.02. The Creation of National Images

317.03. Russian Cultural History Through Film

Note: Taught in English; no knowledge of Russian is required. This course does not count as a prerequisite to other senior Russian courses. This course may be repeated for credit where the course content is different, as indicated by a different decimal number for the course. May be repeated for a maximum credit of 6 units (1.0 full-course equivalent).

Russian 331 **3 units; H(3-1)**

Intermediate Russian I
Strategies for accelerated proficiencies in the areas of vocabulary, the deciphering of written and oral texts and the relating of learned linguistic patterns

to communicative contexts, with attention to appropriate discourse level in a variety of situations.

Prerequisite(s): Russian 303.

Russian 333 **3 units; H(3-1)**

Intermediate Russian II
A continuation of Russian 331.

Prerequisite(s): Russian 331.

Russian 355 **3 units; H(3-0)**

Russian Literature in Translation
Selected texts by author, genre or period designed to explore issues of significance in the context of Russian culture.

Note: Taught in English and no knowledge of Russian is required. May be repeated for credit to a maximum of 6 units (1.0 full-course equivalent).

MAY BE REPEATED FOR CREDIT

Russian 361 **3 units; H(3-0)**

Russian Literature of the Nineteenth and Twentieth Centuries
Overview of Russian literature of the nineteenth and twentieth centuries in a historical perspective, with attention to issues of particular significance in Russian literary culture. Initial experience of literary analysis on the basis of diverse Russian texts.

Prerequisite(s): Russian 303 and 355 or 317.

Russian 363 **3 units; H(3-0)**

Current Issues in Russian Culture
Selected significant issues in Russian culture, as manifested in written and/or oral texts, with particular attention to language function and usage.

Prerequisite(s): Russian 303.

MAY BE REPEATED FOR CREDIT

Russian 397 **3 units; H(3-0)**

Inter-Cultural Immersion Experience I
Independent study course. Project with inter-cultural theme, derived from an immersion experience, most likely abroad. Permission MUST be obtained before embarking on the immersion experience or enrolling in this course.

Prerequisite(s): Consent of the Department. Departmental permission to enrol in this course depends on a faculty member's agreement to sponsor the course of study. To obtain that agreement, a student must first discuss the project with a faculty member orally, then present in written form a coherent and well-formulated project which will demonstrate learning (guidelines are available).

NOT INCLUDED IN GPA

Russian 401 **3 units; H(3-0)**

Advanced Russian I: The Consolidating Year
An advanced course in the use of Russian, including experiential learning in the form of a practicum, leading to supervised "teaching" in a suitable lower-level language class.

Prerequisite(s): Russian 333.

Russian 403 **3 units; H(3-0)**

Advanced Russian II: The Consolidating Year
A continuation of Russian 401.

Prerequisite(s): Russian 401.

Russian 451 **3 units; H(3-0)**

Cross-Cultural Explorations
Cross-cultural comparison of events, cultural patterns, historical periods, or social movements which find a parallel in more than one of the cultural traditions represented in the Department.

Prerequisite(s): Russian 361.

Note: Taught in English.

MAY BE REPEATED FOR CREDIT

Russian 461 **3 units; H(3-0)**

Topics in Russian Literature
Development of a topic, issue, period or author introduced in Russian 361. Topic for current year is listed in the Schedule of Classes.

Prerequisite(s): Russian 361.

MAY BE REPEATED FOR CREDIT

Russian 463 **3 units; H(3-0)**

Topics in Russian Language and Culture from a Historical Perspective
Concentration on a linguistic and/or cultural topic in its historical development.

Prerequisite(s): Russian 361 or 363.

MAY BE REPEATED FOR CREDIT

Russian 497 **3 units; H(3-0)**

Inter-Cultural Immersion Experience II
Independent study course. Project with inter-cultural theme, derived from an immersion experience at an advanced level, most likely abroad. Permission MUST be obtained before embarking on the immersion experience or enrolling in this course.

Prerequisite(s): Russian 397 and consent of the Department. Departmental permission to enrol in this course depends on a faculty member's agreement to sponsor the course of study. To obtain that agreement, a student must first discuss the project with a faculty member orally, then present in written form a coherent and well-formulated project which will demonstrate learning (guidelines are available).

NOT INCLUDED IN GPA

Russian 551 **3 units; H(3-0)**

Independent Study
An independent research project on a topic that is not normally a part of the program's course offerings.

Prerequisite(s): Consent of the Department. Departmental permission to enrol in this course depends on a faculty member's agreement to sponsor the project.

MAY BE REPEATED FOR CREDIT

Russian 561 **3 units; H(3S-0)**

Research Seminar
Centred on a professor's current research project, the course will engage senior students as members of a collaborative research team. Independent research, discussion, group presentations, dissemination of results in an appropriate venue.

Prerequisite(s): Consent of the Department.

Note: May not be offered every year.

MAY BE REPEATED FOR CREDIT

Russian 591 **3 units; H(0-3T)**

Honours Project
The Honours project for Honours students in their final year.

Prerequisite(s): Consent of the Department.

School of Creative and Performing Arts SCPA

Instruction offered by members of Drama in the School of Creative and Performing Arts in the Faculty of Arts.

School of Creative and Performing Arts 501 **3 units; H(2-2)**

Topics in Inter-Arts Collaborations
Experiential or lecture-based work that crosses the disciplinary boundaries of Dance, Drama and Music.

Prerequisite(s): 6 units (1.0 full-course equivalent) in any of Dance, Drama or Music or consent of the School.

MAY BE REPEATED FOR CREDIT

School of Creative and Performing Arts 503 **6 units; F(0-7)**

Travel Study
Prerequisite(s): Consent of the School.

MAY BE REPEATED FOR CREDIT

School of Creative and Performing Arts 601 **3 units; H(2-2)**

Topics in Inter-Arts Collaborations
Experiential or lecture-based work that crosses the disciplinary boundaries of Dance, Drama and Music.

Prerequisite(s): Consent of the School.

MAY BE REPEATED FOR CREDIT

School of Creative and Performing Arts 603 **6 units; F(0-7)**

Travel Study
An international perspective on performance and culture that crosses the disciplinary boundaries of Dance, Drama and Music.

Prerequisite(s): Consent of the School.

MAY BE REPEATED FOR CREDIT

Science SCIE

Instruction offered by members of the Faculty of Science.

†Limited amounts of non-scheduled class time involvement will be required for this course.

Senior Courses

Science 301 **3 units; H(3-1T)**

Research Design and Statistical Analysis
This course will focus on the management, analysis, interpretation and communication of research results. Students will also examine and critique research design using examples from the primary literature in a multidisciplinary context.

Prerequisite(s): 24 units (4.0 full-course equivalents) and admission to the Natural Sciences Program.

Science 311 **3 units; H(3-1T)**

Writing and Reviewing Scientific Reports
Elements of writing and reviewing scientific reports, use and enhancement of library skills, ethical principles of reviewing reports, and exposure to the literature of science. Papers and reviews will be transmitted electronically.

Prerequisite(s): Any 200-level course offered by the Faculty of Science.

Note: Enrolment in this course is limited. Only declared Majors in Chemistry, Applied Chemistry,

Geology, Applied and Environmental Geology, Petroleum Geology or the Geosciences program will be admitted prior to the date registration restrictions are lifted.

Science 331 **3 units; H(3-0)**

Scientific Explorations
Students will develop a well-rounded perspective and appreciation of science by investigating the nature of scientific inquiry and critically assessing key historical and contemporary achievements in science.

†Science 403 **3 units; H(3-0)**

Science in Society
Exploration of the interaction among science and non-science areas in various ways including by written and oral presentations.

Prerequisite(s): 54 units (9.0 full-course equivalents) and admission to the Natural Sciences program.

Science 421 **3 units; H(3-2T)**

Fundamentals of Nuclear Energy Production
The science behind nuclear energy production including nuclear reactions, reactor design, waste disposal and historical and proposed accidents.

Prerequisite(s): Engineering Energy and Environment 355 and Physics 223 or 255, or one of Physics 301, 323, or 325.

Science 423 **3 units; H(3-2T)**

Fundamentals of Fuel Cells
The chemical and physical basis of fuel cells.

Prerequisite(s): Engineering Energy and Environment 355; Physics 223 or 255.

Science 501 **3 units; H(3-0)**

Project Course in Natural Sciences
Intended to achieve integration and interdisciplinarity within the Natural Sciences program.

Prerequisite(s): 75 units (12.5 full-course equivalents) and admission to the Natural Sciences program.

Science 502 **6 units; F(0-9)**

Research Project in Natural Sciences
A comprehensive research project under the direction of staff member(s) in the Faculty of Science. Research projects may be disciplinary or interdisciplinary in nature. Interdisciplinary projects may involve more than one Science discipline or a Science discipline combined with a non-Science discipline.

Prerequisite(s): Admission to the Natural Sciences Honours program and consent of the Director.

Science 507 **3 units; H(3-0) or H(3-3)**

Experiential Learning in Science - Special Topics
Lectures, seminars, tutorials and/or research project leading to a focused examination of a topic from interdisciplinary perspective.

Prerequisite(s): Consent of the Faculty.

Note: Students should contact the USC Specialized Programs Office regarding this course.

MAY BE REPEATED FOR CREDIT

Science 510 **6 units; F**

Field Placement
Students spend one term as an intern in a government, non-profit or private-sector organization under the auspices of an agency or organization that has a Co-operation Agreement with the University of Calgary.

Prerequisite(s): Consent of the Faculty of Science and acceptance to a program offered by the agency or organization that has a Co-operation Agreement with the University of Calgary.

Science 511 **3 units; H(3-0)**

Peer Mentoring and Collaborative Learning in Science
Students (peer mentors) gain theoretical knowledge of peer mentoring, practical facilitation instruction and experience to support peers in their learning. Grounded knowledge of science-based learning theories, peer mentors will encourage and motivate learning, convey enthusiasm for course material, and provide support for active learning in and out of the classroom.

Prerequisite(s): Consent of the Faculty.

Antirequisite(s): Credit for Science 511 and either Science 507.18 or Communication and Culture 507 will not be allowed.

Note: This course includes a 40-hour practicum as a Peer Mentor in your host class. Students should contact the USC Specialized Programs Office regarding consent to register.

Science 521 **3 units; H(3-2T)**

Principles of Solar Energy
The nature of solar radiation and how that energy may be captured for useful energy production.

Prerequisite(s): Engineering Energy and Environment 355.

†Science 529 **3 units; H(3-0)**

Project Course in Sustainable Energy, Environment and Economy
Intended to achieve integration across the interdisciplinary energy, environment and economy programs.

Prerequisite(s): 75 units (12.5 full-course equivalents) and admission to the Energy and the Environment Specialization, the Energy Management Concentration or the Energy Science Concentration.

Science 531 **3 units; H(3-2T)**

Principles of Hydroelectric Energy
An introduction to the scientific fundamentals of hydroelectric energy production. Includes an examination of the technologies and potential for developing hydroelectricity, along with the environmental, societal, and economic issues surrounding its development.

Prerequisite(s): Engineering Energy and Environment 355.

Antirequisite(s): Credit for Science 531 and 523 will not be allowed.

Note: May not be offered every year. Consult the USC Specialized Programs Office for more information.

Science 533 **3 units; H(3-2T)**

Principles of Geothermal Energy
An introduction to the scientific fundamentals of hydroelectric energy production. Includes an examination of the technologies and potential for developing hydroelectricity, along with the environmental, societal, and economic issues surrounding its development.

Prerequisite(s): Engineering Energy and Environment 355.

Antirequisite(s): Credit for Science 533 and 523 will not be allowed.

Note: May not be offered every year. Consult the USC Specialized Programs Office for more information.

Science, Technology and Society STAS

Instruction offered under the direction of the Department of Communication, Media, and Film Studies in the Faculty of Arts.

Junior Course

Science, Technology and Society 201 **3 units; H(3-0)**

Introduction to Science, Technology and Society
An introduction to the roles, uses, and impacts of science and technology within society. Using an inquiry-based approach, students will investigate topics such as the scientific method, gender and technology, the role of experts in policy matters, and public engagement with science and technology.

Senior Courses

Science, Technology and Society 325 **3 units; H(2-1)**

Technology Within Contemporary Society
Examines the definition of technology and major questions concerning the relations between technology and society

Note: This course may not be offered every year.

Science, Technology and Society 327 **3 units; H(3-0)**

Science in Society
A case study analysis of the practice of science as a human activity. The theories linking the emergence of modern science to western culture are considered. An analysis of ideas of the social structure of scientific activity including: the role of examples in forming scientific theories, the value system of scientists in both basic research and applied research environments, "individual genius" vs multiple discovery, and the influence of "leading" figures. The linkages of scientific activity with other cultural dimensions are explored and the bases for formulation of "science policy" are considered.

Note: This course may not be offered every year.

Science, Technology and Society 341 **3 units; H(3-0)**

New Media, Technology, and Society
A study of the implications of information technology for political, social and economic organization, individual psychology, and concepts of knowledge. Historical, ethical and legal implications will be discussed.

Antirequisite(s): Credit for Science, Technology and Society 341 Communications Studies 203 or 380 or General Studies 341 will not be allowed.

Note: This course assumes only very basic familiarity with computers at the "user" level. Familiarization with more advanced applications will be provided as required.

Science, Technology and Society 343 **3 units; H(3-0)**

Canadian Science Policy and Technology Development
Examination and analysis of Canadian science policy and technology development. Factors which influence policies and strategies, and factors which should influence them. Evaluation of success and failures through case studies and policy analysis.

Science, Technology and Society 401 **3 units; H(3-0)**

Special Topics in Science, Technology and Society
An examination of selected topics in Science, Technology and Society. See Schedule of Classes for current topic(s).

MAY BE REPEATED FOR CREDIT

Science, Technology and Society 421 **3 units; H(3-0)**

Publics and Science
Examines how science and concerns over science have been 'made public' via emergent forms of media including novels, radio, television, film, and the Internet, and how various publics have enabled scientific transformations.

Prerequisite(s): 48 units (6.0 full-course equivalents).

Antirequisite(s): Credit for Science, Technology and Society 421 and Communication and Media 393 will not be allowed.

Science, Technology and Society 423 **3 units; H(3-0)**

Politics and Technology
Examines the relationship between politics and technology, and how these shape and structure everyday life. Particular attention will be paid to the ways in which decisions about science and technology fit or do not fit with democratic ideals. Sample topics include democracy and technology; technologies as forms of governance; use of new media in politics; online activism; and politicization of science.

Prerequisite(s): 48 units (8.0 full-course equivalents).

Antirequisite(s): Credit for Science, Technology and Society 423 and 401.03 will not be allowed.

Science, Technology and Society 501 **3 units; H(3-0)**

Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Department.

Note: Students should contact the Department at least two weeks prior to the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Science, Technology and Society 505 **3 units; H(3S-0)**

Topics in Science and Technology Policy Research
Topics in the formulation of science, technology, and/or innovation policy. The knowledge that shapes government, industry and public perceptions of science and technology issues, and how that knowledge is produced, interpreted and absorbed by the policy-making process. Intended for senior students in the Science, Technology and Society major or minor, or students with appropriate course preparation in related disciplines such as economics or political science.

Prerequisite(s): 9 units (1.5 full-course equivalents) in Science, Technology and Society at the 300 level or higher.

Antirequisite(s): Credit for Science, Technology and Society 505 and 401.02 will not be allowed.

Science, Technology and Society 591 **3 units; H(3-0)**

Integrative Seminar
An integrative seminar on the central themes of science and technology studies.

Prerequisite(s): Two of Science, Technology and Society 325, History 477, Philosophy 367, Sociology 435.

Note: This course may not be offered every year. It may be taken as a reading course if an instructor is available.

Slavic SLAV

Instruction offered by members of the Department of Linguistics, Languages, and Culture in the Faculty of Arts.

Senior Course

Slavic 355 **3 units; H(3-0)**

Modern East-European Literature in Translation
Selected works from the literatures of Central European countries in the twentieth century with particular attention to the impact of successive totalitarian régimes and issues associated with post-totalitarian societies.

Note: Taught in English. This course can count toward the Major and Honours in Russian.

Social Work SOWK

Instruction offered by members of the Faculty of Social Work.

Notes:

Social Work 201 is open to all students; all other Social Work courses are restricted to BSW students only.

Students must maintain concurrent registration in practica and related integrative seminars.

In all BSW routes, students must complete all required 300-level core Social Work courses before registering in practica.

Junior Courses

Social Work 201 **3 units; H(3-0)**

Introduction to Social Work
Provides an overview of the profession of social work and the social policy context within which it is practiced.

Note: Alberta Social Work Post-Diploma students cannot take this course as fulfillment of their non-Social Work course requirements.

Senior Courses

Social Work 300 **6 units; F(6-0)**

Generalist Practice in Context Theme Course
Examination of the professional use of self in relation to the knowledge, values, and skills pertaining to the practice of generalist social work practice in rural, remote, and Aboriginal communities.

Social Work 301 **3 units; H(1S-2T)**

Generalist Practice in Context Portfolio Project
Individual preparation of a self-directed portfolio as an expression of the student's own understanding of generalist social work practice in relation to the local context. The student's prior learning experiences will be incorporated in the development of the project.

Corequisite(s): Prerequisite or Corequisite: Social Work 300.

Social Work 302 **6 units; F(6-0)**

Research in Context Theme Course
An introduction to knowledge generation relevant to generalist social work practice. Foundational concepts and approaches of various research methodologies will be introduced as ways of knowledge building to inform practice and influence policy, particularly within rural, remote and Indigenous contexts.

Social Work 303 **3 units; H(1S-2T)**

Practice With Individuals in Context
Focuses on interviewing and counseling skills from a generalist social work perspective. Emphasis will be given to skill development, critical reflection, practice evaluation, and practical application within rural, remote and Indigenous contexts.

Social Work 304 **6 units; F(6-0)**

Diversity and Oppression Theme Course
Examines diversity, colonization, oppression, and intergroup relations associated with the practice of social work in rural, remote, and Indigenous communities. Anti-oppressive frameworks will be introduced for understanding the processes associated with social justice.

Social Work 305 **3 units; H(1S-2T)**

Diversity and Oppression Portfolio Project
Individual preparation of a self-directed portfolio as an expression of the student's own critical analysis of diversity, oppression, and social justice in relation to the local context. Honouring the student's prior learning experiences by acknowledging and incorporating aspects of that learning in the development of the project.

Corequisite(s): Prerequisite or Corequisite: Social Work 304.

Social Work 306 **6 units; F(6-0)**

Social Work Methods Course
Examines various perspectives and theoretical approaches relating to the development, maintenance, and application of empowering relationships in generalist social work practice. Particular emphasis will be placed on local applications in rural, remote, and Indigenous organizations and communities.

Social Work 307 **3 units; H(1S-2T)**

Practice Skills in Context
Focuses on theory and practice relating to social work with individuals, families and groups in diverse communities. Particular emphasis will be paid to skill development, critical analysis and practical application within rural, remote and Indigenous contexts.

Social Work 355 **3 units; H(3S-0)**

Research in Context
Students will be introduced to basic research methodology and data analysis within a reflective practitioner model of practice. They will be asked to identify research concepts, methods and skills that promote enquiry-based practice and that

enable them to read and apply findings from research. The focus of the course will be on thinking of research as an integral component of practice.

Social Work 361 **3 units; H(3S-0)**

Professional Use of Self
Focuses on the examination and integration of theoretical and practical understandings of professional social work practice. Topics covered include: critical thinking; ethical decision-making; knowledge of the associations to which social work professionals belong; professional writing; and self-care.

Social Work 363 **3 units; H(3S-0)**

Human Development and Environments
Explores the nature of human behaviour and development in diverse environments and contexts (personal, community, social, and environmental) and explores the implications for social work practice and theory.

Social Work 365 **3 units; H(3S-0)**

Critical Approaches to Social Work Practice
Provides theoretical frameworks, including anti-oppressive social work concepts, as a foundation for reflective professional generalist social work.

Social Work 371 **3 units; H(3S-0)**

Social Work and Diversity
Students will critically examine the issues of diversity and the power relations that form common links among the experiences of oppression and marginalization in Canadian society.

Social Work 383 **3 units; H(3S-0)**

Social Policy and Social Justice
Provides an understanding of Canadian social policy, its impact on social justice and how it influences social work practice.

Note: University Transfer route only.

Social Work 391 **3 units; H(3S-0)**

Practice and Evaluation with Individuals
An introduction to theories and skills for communicating with people in a professional social work context. Generic interviewing and basic counselling skills from a generalist perspective of social work practice will be developed.

Note: University Transfer route only.

Social Work 393 **3 units; H(3S-0)**

Practice and Evaluation with Families
An introduction to theories and skills for family-centred social work practice with families. There will be an emphasis on diversity in relation to family development issues, the stresses families face, family assessment techniques, and theories and practices of family intervention.

Note: University Transfer route only.

Social Work 395 **3 units; H(3S-0)**

Practice and Evaluation with Groups
An introduction to theories and skills for working with groups within a context of practice and assessment frameworks.

Note: University Transfer route only.

Social Work 397 **3 units; H(3S-0)**

Practice and Evaluation with Communities
An introduction to theories and skills about community practice. The focus will be on understanding the basic value, ethical, strategic, evaluative and political issues involved in working for community change.

Antirequisite(s): Credit for Social Work 397 and Community Rehabilitation 583 will not be allowed.

Note: University Transfer route only.

Social Work 399 **3 units; H(3S-0)**

Practice and Evaluation with Organizations
An introduction to theories and skills in the study of human service organizations. Examines organizational dynamics and how this impacts on professional practice, relationships with clients, and the potential for organizational change.

Note: University Transfer route only.

Social Work 410 **6 units; F(300 hours within one term)**

Practicum I
Application of conceptual framework, experience, knowledge and skills within a specific practice setting.

Prerequisite(s): All required 300 level Social Work courses.

NOT INCLUDED IN GPA

Social Work 411 **3 units; H(3S-0)**

Integrative Seminar I
Integration of theory and practice within the context of the field practicum.

Prerequisite(s): All required 300 level Social Work courses.

Corequisite(s): Social Work 410.

Social Work 412 **6 units; F(400 hours within one term)**

Practicum II
Application of professional theory and skills in supervised social work practice settings.

Prerequisite(s): All required 300 level Social Work courses. University Transfer Route: Social Work 410 and 411.

NOT INCLUDED IN GPA

Social Work 413 **3 units; H(3S-0)**

Integrative Seminar II
Advanced integration of concepts, perspectives and skills with experiences, developing conceptual frameworks of practice.

Prerequisite(s): All required 300 level Social Work courses. University Transfer Route: Social Work 410 and 411.

Corequisite(s): Social Work 412.

Social Work 551 **3 units; H(3S-0)**

Selected Topics: Social Work Interventions
Prerequisite(s): Social Work 353 or 355, 363 or 367, 383, 361 or 385 and 365 or 388, or admission into the Post-Diploma route.

MAY BE REPEATED FOR CREDIT

Social Work 553 **3 units; H(3S-0)**

Selected Topics: Fields of Practice
Prerequisite(s): Social Work 353 or 355, 363 or 367, 383, 361 or 385 and 365 or 388, or admission into the Post Diploma route.

MAY BE REPEATED FOR CREDIT

Social Work 555 **3 units; H(3S-0)**

Selected Topics: Practice with Selected Populations
Prerequisite(s): Social Work 353 or 355, 363 or 367, 383, 361 or 385 and 365 or 388, or admission into the Post-Diploma route.

MAY BE REPEATED FOR CREDIT

Social Work 557 **3 units; H(3S-0)**

Selected Topics: Contexts for Practice
Prerequisite(s): Social Work 353 or 355, 363 or 367, 383, 361 or 385 and 365 or 388, or admission into the Post-Diploma route.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Note: Not all options are offered every academic year. The number of options will vary across the programs and program locations.

Social Work 621 **3 units; H(3S-0)**

History and Foundation of the Profession
An examination of the relationship between knowledge, values, ethics and power and how they shape interventions in social work.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 625 **3 units; H(3S-0)**

Practice with Individuals, Families and Groups
A basic understanding of social work practice theory with respect to work with individuals, families and groups.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 627 **3 units; H(3S-0)**

Practice with Organizations and Communities
A basic understanding of social work practice theory with respect to work with organizations and communities.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 629 **3 units; H(3S-0)**

Professional Communication and Interviewing
Offers experiential learning aimed at developing basic professional competencies and practice skills along with critical self-reflection.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 632 **3 units; H(3S-0)**

Social Policy and Social Justice
An exploration of the social, political and economic forces, social movements and social structures that are transforming the Canadian welfare state and the practice of social work.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 633 **3 units; H(426 hours-2T)**

Foundational Field Practicum
Direct and indirect social work practice opportunities with professional supervision.

Note: Restricted to Social Work MSW students or consent of the Faculty.

NOT INCLUDED IN GPA

Social Work 637 **3 units; H(3S-0)**

Human Behaviour in the Environment
Human development and diversity within a social work context.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 641 **3 units; H(3S-0)**

Models of Practice
Provides the conceptual and theoretical foundation for students to acquire the skills to practice in Social Work.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 645 **3 units; H(3S-0)**

Issues in Social Work Research
An overview of social work research topics and issues.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 651 **3 units; H(3S-0)**

Policy as Context for Clinical Work
Policies and their impacts on the delivery of clinical work will be examined.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 653 **3 units; H(3S-0)**

Comparative Approaches to Change
Various clinical change applications will be examined and critiqued.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 655 **3 units; H(3S-0)**

Thesis Research
An introduction to preparing a thesis proposal.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 657 **3 units; H(3S-0)**

Clinical Social Work Applications
Specific issues involved in the effective application of clinical approaches will be studied.

Prerequisite(s): Social Work 653.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 659 **3 units; H(3S-0)**

Evidence and Clinical Practice
Research as utilized in the clinical arena will be the focus of this course.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 665 **3 units; H(3S-0)**

Influencing Policy Development
The focus of this course is leadership in policy practice and in particular policy advocacy at all levels of policy (i.e., organizational, community, and provincial or national levels).

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 667 **3 units; H(3S-0)**

Leadership Theories in Action
Directed toward helping prepare leaders for "best practice" across the range of sectors and roles in which human service leaders work.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 669 **3 units; H(3S-0)**

Leading Organizations and Communities
A practical course that will emphasize networked and collaborative approaches to leadership in a global context.

Prerequisite(s): Social Work 667.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 671 **3 units; H(3S-0)**

Social Policy
Explores social welfare policy in Canada and in a globalizing world, the current roles of social welfare policy, and the roles they should have.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 673 **3 units; H(3S-0)**

International Social Development
Examines issues in international social development. There will be an emphasis on analysis of the social forces and conditions giving rise to different models of social development, and on what each of these alternative models tends to produce in terms of social welfare policies and programs.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 675 **3 units; H(3S-0)**

Advanced International Social Work Modules
This set of modules will give students tools for social change.

Prerequisite(s): Social Work 673.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 677 **3 units; H(3S-0)**

Social Work Research for International and Community Methods
International and Community Development Research is designed to provide methodological knowledge and skills specifically oriented to community-based practice abroad or in Canada.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 679 **3 units; H(3S-0)**

Special Topics Seminar I
Selected topics related to area of specialization or interest.

Note: Restricted to Social Work MSW students or consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Social Work 682 **0.75 units; E(3S-0)**

Special Seminar II
Selected topics related to an area of specialization or interest.

Note: Restricted to Social Work MSW students or consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Social Work 693 **3 units; H(3S-0)**

Research as a Foundation for Leadership
This course will provide students with a working understanding for the study and nature of the theoretical and practical issues underlying the application of the research process to professional and leadership practice.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 695 **3 units; H(3S-0)**

Becoming an Evidence-Based Leader
Extends students' abilities to identify, assess, and utilize research knowledge as a problem-solving tool in social work.

Prerequisite(s): Social Work 693.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 696 **6 units; F(525 hours within two consecutive terms)**

Advanced Practicum
Direct and indirect Social Work practice opportunities with professional supervision in student's area of specialization or interest.

Prerequisite(s): Admission to the MSW program.

Note: Restricted to Social Work MSW students or consent of the Faculty.

NOT INCLUDED IN GPA

Social Work 697 **3 units; H(3S-0)**

Diversity, Oppression and Social Justice
Critical examination of the issues of diversity and the power relations that form common links among the experiences of oppression and marginalization in Canadian society.

Note: Restricted to Social Work MSW students or consent of the Faculty.

Social Work 699 **3 units; H(3S-0)**

Special Topics Seminar II
Advanced selected topics related to area of specialization or interest.

Note: Restricted to Social Work MSW students or consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Social Work 721 **3 units; H(3S-0)**

Integrative Research Colloquia
A concluding course offered as final component of student's course work. Allows doctoral students and the instructor to engage in a series of research colloquia, thereby facilitating critical analysis, feedback and synthesis of materials covered and skills learned in other course work. This process will help students to develop conceptual and methodological skills.

Note: Restricted to Social Work PhD students. Social Work 721 can only be taken once all other required (core and option) courses have been completed.

Social Work 741 **3 units; H(3S-0)**

Research Foundations: Epistemology and Professional Knowledge-Building
An exploration of major philosophical issues that have shaped social work's diverse approaches to knowledge building and research methods. The relevance of this exploration to the student's area of interest is emphasized.

Note: Restricted to Social Work PhD students. PhD students from other disciplines may register with consent of the Faculty.

Social Work 743 **3 units; H(3S-0)**

Theory, History and Philosophy: Values, Ethics and Professional Beliefs
An exploration of the philosophical and ideological issues that have been historically important to the profession with respect to its conception of its ethics, mandate and practices. The relevance of this exploration to the student's area of interest in emphasized.

Note: Restricted to Social Work PhD students. PhD students from other disciplines may register with consent of the Faculty.

Social Work 745 **3 units; H(3S-0)**

Research Methods I: Quantitative
Quantitative methodological and design options in social work research.

Note: Restricted to Social Work PhD students. PhD students from other disciplines may register with consent of the Faculty.

Social Work 747 **3 units; H(3S-0)**

Research Methods II: Qualitative
Qualitative methodological and design options in social work research.

Note: Restricted to Social Work PhD students. PhD students from other disciplines may register with consent of the Faculty.

Social Work 749 **3 units; H(3S-0)**

Quantitative Data Analysis
Statistical analysis of quantitative data.

Note: Restricted to Social Work PhD students. PhD students from other disciplines may register with consent of the Faculty.

Social Work 799 **3 units; H(3S-0)**

Special Topics Seminar
Advanced selected topics related to the PhD focus area.

Note: Restricted to Social Work PhD students.

MAY BE REPEATED FOR CREDIT

Sociology SOCI

Instruction offered by members of the Department of Sociology in the Faculty of Arts.

Junior Courses

Sociology 201 **3 units; H(3-1T)**

Introductory Sociology
Sociology as a discipline examines how the society in which we live influences our thinking and behaviour. An introduction to sociology will be provided through the study of society, social institutions, group behaviour and social change.

Sociology 205 **3 units; H(3-0)**

Canadian Society
An examination of the major institutions of Canadian society. Consideration given to the diversity of the Canadian population and to the dynamics of contemporary patterns of social change.

Antirequisite(s): Credit for Sociology 205 and Social Sciences 202 will not be allowed.

Note: This course is not a substitute for Sociology 201.

Senior Courses

Sociology 301 **3 units; H(3-0)**

Selected Topics in Sociology
Prerequisite(s): Sociology 201.

MAY BE REPEATED FOR CREDIT

Sociology 303 **3 units; H(3-0)**

Sociology of Gender
A sociological exploration of the way genders are constructed and how they play-out at the level of individuals and institutions, and in diverse social contexts.

Prerequisite(s): Sociology 201.

Sociology 307 **3 units; H(3-0)**

Sociology of First Nations in Canada
The dynamics of Native Indian groups' relations with each other and the larger society. Topics include decolonization and relations with the state, demography, Indian organizations, Indian nationalism and nation-building, power, social class and public policy.

Prerequisite(s): Sociology 201.

Sociology 309 **3 units; H(3-0)**

Alberta Society
An historical and contemporary overview of First Nations' life in Canada. Introduces the student to the Indian Act, treaties, economic development, education, demography, urbanization, popular culture and other topics.

Prerequisite(s): Sociology 201.

Sociology 311 **3 units; H(3-3)**

Introductory Social Statistics I
Univariate and bivariate statistics for survey data. Topics include cross tabular analysis, the normal distribution, confidence intervals for means, hypothesis testing, Chi-squared and F distributions and bivariate linear regression analysis. In labs students will use statistical software to analyze survey data.

Prerequisite(s): Sociology 201.

Antirequisite(s): Credit towards degree requirements will be given for only one of Sociology 311 and Engineering 319, Political Science 399, Psychology 312, Statistics 205, 213, 217, 327; that one being a course appropriate to the degree program.

Sociology 313 **3 units; H(3-2)**

Introductory Social Research Methods
Research processes including problem definition, data collection and analyses; quantitative and qualitative strategies. Students are expected to acquire skills through doing research.

Prerequisite(s): Sociology 201.

Sociology 315 **3 units; H(3-3)**

Introductory Social Statistics II
Multivariate statistics for survey data; and measurement issues in quantitative research. Topics include reliability, multivariate tabular analysis, multiple regression, dummy variable regression, statistical interaction and path analysis. In labs students will use statistical software to test measurement and causal models.

Prerequisite(s): Sociology 311.

Sociology 321 **3 units; H(3-0)**

Sociology of Health and Illness
Introduction to social factors influencing health, illness, and medicine. Topics covered may include the organization of medical institutions and occupations, the socialization of medical professionals, the social construction of illness, social determinants of health, and comparative health care systems and policy.

Prerequisite(s): Sociology 201.

Sociology 325 **3 units; H(3-0)**

Introduction to Deviance and Social Control
The presentation and analysis of theories of criminality and of non-criminal deviance, methods to uncover the incidence of deviance and criminality, a survey of forms of deviant and criminal behaviours, and the social and institutional responses to them.

Prerequisite(s): Sociology 201.

Sociology 327 **3 units; H(3-0)**

Introduction to Criminal Justice
Introduction to the field of criminal justice in Canada from a sociological perspective. May include: examination of the definitions of crime; crime measurement; institutional responses to crime by the police, the courts and correctional services; and alternatives to the justice model.

Prerequisite(s): Sociology 201.

Antirequisite(s): Credit for Sociology 327 and 427 will not be allowed.

Sociology 331 **3 units; H(3-0)**

Classical Sociological Theory
The development of sociological theory from the nineteenth century to the Second World War.

Prerequisite(s): Sociology 201.

Sociology 333 **3 units; H(3-0)**

Contemporary Sociological Theory
The development of sociological theory from the Second World War to the present.

Prerequisite(s): Sociology 331.

Sociology 341 **3 units; H(3-0)**

Social Psychology
A wide range of interdependent individual and social topics that influence our thinking, feeling, and behaviour. Topics may include social cognition, perception, social experience, group behaviour, social interaction, and emotions.

Prerequisite(s): Sociology 201.

Antirequisite(s): Credit for Sociology 341 and Psychology 345 will not be allowed.

Sociology 345 **3 units; H(3-0)**

Mass Communication
A critical, theoretically-informed look at what it means to live in a society in which the forms and content of mass media/mass communication – and our uses of them – shape our lives in significant ways.

Prerequisite(s): Sociology 201.

Sociology 353 **3 units; H(3-0)**

Urban Sociology
Discusses the impact of urbanization on social relationships by analysing city living in historical and global perspective but also through local issues such as density and neighborhoods. The objective is to provide a sociological perspective on issues that cities are facing today.

Prerequisite(s): Sociology 201.

Sociology 355 **3 units; H(3-0)**

Population and Society
Introduction to social demography – the study of population structure (size, composition and distribution) and processes (fertility, mortality and migration). Focuses on both empirical and theoretical relationships between demography, social change and structured inequality.

Prerequisite(s): Sociology 201.

Sociology 365 **3 units; H(3-0)**

Social Stratification
Introduction to the sociological study of social inequalities and stratification and the major theoretical explanations of social inequalities.

Prerequisite(s): Sociology 201.

Sociology 371 **3 units; H(3-0)**

Sociology of Families
A sociological examination of family life in all its multiple and changing forms. Topics may include key transitions and common practices in family life; gender, sexuality and family life, and family life in cross-cultural context.

Prerequisite(s): Sociology 201.

Sociology 373 **3 units; H(3-0)**

Sociology of Aging
Social and institutional factors associated with aging in modern society.

Prerequisite(s): Sociology 201.

Sociology 375 **3 units; H(3-0)**

Sociology of Ethnicity and Racialization
Introduction to the forms of ethnic and racial dynamics in selected cases around the world. Such concepts as identity, ethnicity, race, racialization, racism, assimilation, integration, pluralism, colonialism, post-colonialism, transnationalism and diasporas are examined in theoretical and cross-national contexts.

Prerequisite(s): Sociology 201.

Sociology 377 **3 units; H(3-0)**

Sociology of Religion
An introduction to the theories and concepts utilized by sociologists to interpret religious behaviour and the organization of religion.

Prerequisite(s): Sociology 201.

Sociology 393 **3 units; H(3-0)**

Sociology of Work
A sociological perspective for gaining a better understanding of the meaning and nature of work. Provides an overview of core concepts and current topics fundamental to understanding work in society.

Prerequisite(s): Sociology 201.

Sociology 399 **3 units; H(3-0)**

Sociology of Sport
Organized around the theme of social problems in sport, this course examines sports-related behaviour, consumption, and sponsorship. A variety of approaches shows how sport is socially constructed and embodies different meanings for different groups of people.

Prerequisite(s): Sociology 201.

Antirequisite(s): Credit for Sociology 399 and Kinesiology 244 will not be allowed.

Sociology 400 **6 units; F(3S-0)**

Sociology Honours Thesis and Seminar
A research project under the direction of a supervisor. In the seminar students will discuss and present their projects, and other relevant topics.

Prerequisite(s): Sociology 313, admission to the Sociology Honours program and consent of the Department.

Note: Consult Department for assignment to faculty member.

Sociology 401 **3 units; H(3-0)**

Special Topics in Sociology
Selected themes as announced by the Department.

Note: Sociology 313, 331 and 333 are recommended as prerequisites. Consult Department for specific course topics.

MAY BE REPEATED FOR CREDIT

Sociology 403 **3 units; H(3-0)**

Special Topics in Gender Relations
Selected themes and issues in the sociology of gender relations as announced by the Department.

Prerequisite(s): Sociology 303 and 313.

Note: Sociology 331 and 333 are recommended as prerequisites. May be used for credit toward the concentration in Gender, Family and Work a maximum of twice.

MAY BE REPEATED FOR CREDIT

Sociology 405 **3 units; H(3-0)**

Special Topics in Canadian Social Structure
A macro-level examination of Canadian social structure including a socio-developmental analysis of selected Canadian institutions such as bilingualism, regionalism, multiculturalism, multinational corporations, and ethnic stratification. Critical examination of sociological models for the study of Canadian society.

Prerequisite(s): Sociology 313.

Note: Sociology 331 and 333 are recommended as prerequisites.

Sociology 407 **3 units; H(3-0)**
(formerly Sociology 401.15)

Sociology of the Body
Considers aspects of the lived body and the body as object of social construction, modification, and regulation.

Prerequisite(s): Sociology 313 and 321.

Sociology 409 **3 units; H(3-0)**
(formerly Sociology 401.16)

Social Determinants of Health
An advanced study of health in a social context. Examines the social determinants of health and illness outcomes along with their implications for public policies conducive to better health.

Prerequisite(s): Sociology 313 and 321.

Sociology 413 **3 units; H(3-0)**

Qualitative Research Methods
Research methods such as participant observation, naturalistic observation, interviewing, non-reactive techniques, and life histories, and methodological issues such as gaining access to subjects, and issues pertaining to the ethics of research.

Prerequisite(s): Sociology 313.

Note: Sociology 331 and 333 are recommended as prerequisites.

Sociology 419 **3 units; H(3-0)**

Special Topics in the Sociology of Health and Illness
Advanced analysis of selected themes and issues in the sociology of health and illness, as announced by the Department.

Prerequisite(s): Sociology 313 and 321.

Note: May be used for credit toward the concentration in the Sociology of Health a maximum of twice. May be used for credit toward the concentration in the Sociology of Health only once for students who present credit in Sociology 401.17.

MAY BE REPEATED FOR CREDIT

Sociology 421 **3 units; H(3-0)**

Special Topics in Deviance and Criminology
Advanced study of contemporary issues in the research in deviance and crime.

Prerequisite(s): Sociology 325 and 313.

Note: Sociology 331 and 333 are recommended as prerequisites. May be used for credit toward the concentration in Criminology, Deviance and Social Control a maximum of twice.

MAY BE REPEATED FOR CREDIT

Sociology 423 **3 units; H(3-0)**

The Sociology of Youth Crime
Explanations of the criminal activities of young people including an assessment of treatment strategies and legal regimes developed in response to this behaviour.

Prerequisite(s): Sociology 327 and 313.

Note: Sociology 325, 331 and 333 are recommended as prerequisites.

Sociology 425 **3 units; H(3-0)**

The Sociology of Violence
An exploration of violence in a variety of situations and social institutions and more general patterns of victimization in contemporary society.

Prerequisite(s): Sociology 313 and 325.

Sociology 427 **3 units; H(3-0)**

The Social Organization of Criminal Justice
Comparative social organization of the criminal justice system from a sociological perspective; special attention to and analysis of the structure of the Canadian criminal justice system.

Prerequisite(s): Sociology 327 and 313.

Note: Sociology 325, 331 and 333 are recommended as prerequisites.

Sociology 429 **3 units; H(3-0)**

The Sociology of Law
Sociological problems regarding the origin, impact and definition of law, dispute resolution, and the relationship between law and social change.

Prerequisite(s): Sociology 327 and 313. Sociology 325, 331 and 333 are recommended.

Sociology 435 **3 units; H(3-0)**

The Sociology of Knowledge
The study of knowledge as a social practice; theories of knowledge, representation and interpretation; practical knowledge in everyday life; the role of organized knowledge in social domains such as science, biomedicine, bureaucracy, social service administration and professional occupations.

Prerequisite(s): Sociology 331 and 333 or equivalents. Sociology 313 is recommended.

Sociology 443 **3 units; H(3-0)**

Special Topics in Social Psychology
An advanced study of social processes and interactions of persons in groups with some methodological considerations.

Prerequisite(s): Sociology 341 and 313. Sociology 331 and 333 are recommended.

MAY BE REPEATED FOR CREDIT

Sociology 445 **3 units; H(3-0)**
(formerly Sociology 401.36)

Visual Sociology
Visual representation in contemporary society. Social Practices of making and using Visual images, such as photographs. The use of visual methods in sociological research.

Prerequisite(s): Sociology 313, 331, and 333.

Sociology 453 **3 units; H(3-0)**

Special Topics in Urban Sociology
Critical analysis of theories of urban institutional and ecological characteristics. Emphasis is on comparative data derived from a sample of world cities.

Prerequisite(s): Sociology 313 and 353. Sociology 331 and 333 are recommended.

MAY BE REPEATED FOR CREDIT

Sociology 461 **3 units; H(3-0)**

Worker Movements and Labour Unions
A social movement perspective on working class struggle and accommodation in capitalist societies. Historical and contemporary movements will be considered, with an emphasis on Canada.

Prerequisite(s): Sociology 313 and one of 331, 333, or 365.

Sociology 467 **3 units; H(3-0)**

Ethnic Relations in Canada
An introduction to the structure and form of ethnic (racial) group relations in Canada. Contemporary relations will be analyzed from a historical perspective.

Prerequisite(s): Sociology 313 and 375. Sociology 331 and 333 are recommended.

Sociology 471 **3 units; H(3-0)**

Special Topics in the Sociology of Families
Selected themes and issues in the sociology of families as announced by the Department.

Prerequisite(s): Sociology 371 and 313. Sociology 331 and 333 are recommended.

Note: May be used for credit toward the concentration in Gender, Family and Work a maximum of twice.

MAY BE REPEATED FOR CREDIT

Sociology 475 **3 units; H(3-0)**

Special Topics in Race and Ethnic Relations
Advanced analysis of selected themes and issues in race and ethnic relations within the framework of theory and research.

Prerequisite(s): Sociology 313 and 375. Sociology 331 and 333 are recommended.

Note: May be used for credit toward the concentration in Ethnicity, Population and Canadian Society a maximum of twice.

MAY BE REPEATED FOR CREDIT

Sociology 487 **3 units; H(3-0)**

Sociology of Development
A study of the process of change and modernization in the developing areas of the world.

Prerequisite(s): Sociology 313 and one of 331, 333.

Sociology 493 **3 units; H(3-0)**

Special Topics in the Sociology of Work
Selected themes and issues in the sociology of work as announced by the Department.

Prerequisite(s): Sociology 313 and 393. Sociology 331 and 333 are recommended.

Note: May be used for credit toward the concentration in Gender, Family and Work a maximum of twice.

MAY BE REPEATED FOR CREDIT

Sociology 499 **1.5 units; Q(3S-0)**

Field School/Seminar in Sociology
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Sociology 501 **3 units; H(3-0)**

Conference Course in Sociology
Arranged for various topics of Sociology on the basis of special interest and need.

Prerequisite(s): Sociology 313, 315, and 333 and at least two Sociology courses at the 400 level.

Note: May be taken for credit a maximum of twice.

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Sociology 601 **3 units; H(3S-0)**

Seminar in Special Topics in Sociology
Arranged for various topics of Sociology on the basis of special interest and need.

Prerequisite(s): Consult Department for assignment to Faculty member.

MAY BE REPEATED FOR CREDIT

Sociology 602 **6 units; F(3/2S-0)**

Master's Seminar in Professional Sociology
NOT INCLUDED IN GPA

Sociology 603 **3 units; H(3S-0)**

Seminar in Sociology of Health and Illness
Prerequisite(s): Consent of the Department.

Sociology 611 **3 units; H(3S-3)**

Social Statistics: The General Linear Model
Multiple regression with applications to sociological research, with topics such as regression diagnostics, categorical predictors, non-linear relationships, logistic regression, and testing of mediation and moderation.

Prerequisite(s): Consent of the Department. (Sociology 311 and 315 normally required.)

Sociology 613 **3 units; H(3S-2)**

Seminar in Quantitative Research Methods
Advanced study in the theory and practice of quantitative research methods. Topics may include the logic of causality, mixed methods designs, sampling, measurement, survey construction and implementation.

Prerequisite(s): Sociology 313.

Sociology 615 **3 units; H(3S-0)**

Seminar in Qualitative Research Methods
Advanced study in the theory and practice of qualitative research methods. Topics may include participant observation, in-depth interviews, narrative analysis, conversation and discourse analysis, autoethnography, archival research, and feminist research methods.

Prerequisite(s): Sociology 313. Sociology 413 is recommended.

Sociology 625 **3 units; H(3S-0)**

Seminar on Deviant Behaviour
Prerequisite(s): Sociology 325.

Sociology 631 **3 units; H(3S-0)**

Seminar in Sociological Theory
Prerequisite(s): Sociology 331 and 333 or equivalents.

Sociology 653 **3 units; H(3S-0)**

Seminar on Urban Sociology
Prerequisite(s): Sociology 353.

Sociology 667 **3 units; H(3S-0)**

Seminar on Ethnic Relations
Prerequisite(s): Sociology 375.

Sociology 671 **3 units; H(3S-0)**

Seminar on Families, Relationships, and Personal Life
Prerequisite(s): Sociology 471.

Sociology 677 **3 units; H(3S-0)**

Seminar in Sociology of Gender Relations
Prerequisite(s): Consent of the Department.

Sociology 699 **1.5 units; Q(0-3)**

Special Topics in Sociology
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Sociology 701 **3 units; H(3S-0)**

Doctoral Seminar in Sociology
Seminar on selected topics. Consult Department for details.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Sociology 702 **6 units; F(3/2S-0)**

Doctoral Seminar in Professional Sociology
Prerequisite(s): Consent of the Department.

NOT INCLUDED IN GPA

Sociology 705 **1.5 units; Q(3S-0)**

Selected Topics in Advanced Methodological Issues
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Sociology 711 **1.5 units; Q(3S-3)**

Selected Topics in Advanced Quantitative Methods
Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Sociology 715 1.5 units; Q(3S-0)

Selected Topics in Advanced Qualitative Methods
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Sociology 731 3 units; H(3S-0)

Doctoral Seminar in Sociological Theory
Prerequisite(s): Consent of the Department.

Software Engineering SENG

Instruction offered by members of the Department of Computer Science in the Faculty of Science and the Department of Electrical and Computer Engineering in the Schulich School of Engineering.

Senior Courses

Software Engineering 301 3 units; H(3-1T-2)

Software Analysis and Design
Introduction to developing large-scale, quality software, from analysis of requirements, through design, implementation, and testing. Introduction to design for non-functional properties of software. Emphasis on individual skills.

Prerequisite(s): Computer Science 319 or 331.

Antirequisite(s): Credit for Software Engineering 301 and any of Software Engineering 311, Computer Science 301 or 333 will not be allowed.

Software Engineering 401 3 units; H(3-2)

Software Architecture
Software architectures and design for non-functional software properties. Introduction to program comprehension skills including analysis of existing architectures.

Prerequisite(s): Software Engineering 301.

Antirequisite(s): Credit for Software Engineering 401 and Software Engineering 443 will not be allowed.

Software Engineering 403 3 units; H(3-3T)

Software Development in Teams and Organizations
A comparison of alternative software processes emphasizing both their strengths and weaknesses. Addresses the human, social, societal, ethical, and organizational factors inherent in real-world software development. Emphasis on team development skills in a large-scale development project.

Prerequisite(s): Software Engineering 301.

Antirequisite(s): Credit for Software Engineering 403 and any of Software Engineering 411 or Computer Science 301 or 451 will not be allowed.

Software Engineering 437 3 units; H(3-2)

Software Testing
Concepts, methods, techniques, processes, and tools for software testing.

Prerequisite(s): Software Engineering 301.

Software Engineering 471 3 units; H(3-2) (formerly Software Engineering for Engineers 471)

Software Requirements Engineering
Introduction to elicitation, modelling, expression and validation of the requirements. Techniques and methodologies for requirements engineering. Applications of requirements engineering to the management of the software development lifecycle.

Prerequisite(s): Software Engineering 301 or Computer Science 301.

Software Engineering 499 3 units; H(3-2)

Introductory Topics in Software Engineering
Special topics at an introductory level on software development methods, technologies, or tools.

Prerequisite(s): Consent of either the Department of Electrical and Computer Engineering or the Department of Computer Science.

Note: Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.

MAY BE REPEATED FOR CREDIT

Software Engineering 501 3 units; H(3-2)

Advanced Topics in Software Engineering
Special topics at an advanced level on software development methods, technologies, or tools.

Prerequisite(s): Consent of either the Department of Electrical and Computer Engineering or the Department of Computer Science.

Note: Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.

MAY BE REPEATED FOR CREDIT

Software Engineering 511 3 units; H(3-2)

Software Process and Project Management
Analysis of methods, tools, and techniques for software process improvement and software project management as an effort to achieve quality software products.

Prerequisite(s): Software Engineering 403 or 411.

Software Engineering 513 3 units; H(3-2)

Web-Based Systems
An overview of software engineering methods and technologies for developing web-based software systems.

Prerequisite(s): Software Engineering 301.

Software Engineering 515 3 units; H(3-2)

Agile Software Engineering
Investigation and application of agile software development practices.

Prerequisite(s): One of Software Engineering 401, 403, 411, or 443.

Software Engineering 521 3 units; H(3-2)

Software Reliability and Software Quality
The principles, processes, and applications of software reliability and software quality assurance.

Prerequisite(s): Software Engineering 437 or 421.

Antirequisite(s): Credit for Software Engineering 521 and 637 will not be allowed.

Software Engineering 523 3 units; H(3-2T)

Formal Methods
Software specification, verification, and validation using a mathematically rigorous technique.

Prerequisite(s): Software Engineering 403 or 411.

Software Engineering 533 3 units; H(3-2) (formerly Software Engineering for Engineers 533)

Software Performance Evaluation
Analysing quality requirements of large-scale software. Performance analysis, testing, and tuning techniques. Evaluating software scalability. Capacity planning methodologies. Issues related to safety, security, and availability of software.

Prerequisite(s): One of Software Engineering 301 or Computer Engineering 493 and one of Computer Science 457, Software Engineering for Engineers 413, or Computer Engineering 491.

Software Engineering 541 3 units; H(3-2T) (formerly Software Engineering 531)

Fundamentals of Software Evolution and Reuse
Phenomena and approaches involved in the evolution and reuse of large-scale software, including design for modifiability and tool support. Strengths and weaknesses of industrially-current techniques as well as recent research results.

Prerequisite(s): Software Engineering 301.

Antirequisite(s): Credit for Software Engineering 541 and 641 will not be allowed.

Graduate Courses

Software Engineering 605 1.5 units; Q(3-1)

Industrial Topics in Software Engineering
A study of practical approaches of industrial relevance to students specializing in Software Engineering.

Note: Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.

MAY BE REPEATED FOR CREDIT

Software Engineering 607 3 units; H(3-1)

Special Topics in Software Engineering
A study of problems of particular interest to students specializing in Software Engineering.

Note: Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.

MAY BE REPEATED FOR CREDIT

Software Engineering 609 1.5 units; Q(3-1)

Special Topics in Software Engineering
A study of problems of particular interest to students specializing in Software Engineering.

Note: Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.

MAY BE REPEATED FOR CREDIT

Software Engineering 611 1.5 units; Q(3-1)

Requirements Engineering I
The elicitation, modelling, expression, and validation of requirements.

Software Engineering 615 3 units; H(3-1)

Agile Software Engineering
Investigation and application of agile software development practices.

Note: Students are expected to have some background in software development as preparation for this course.

Software Engineering 622 3 units; H(3-1)

Software Release Planning
Product release planning covers systematic methods, tools and techniques for defining the functionality of a sequence of product releases in incremental development. The planning and re-planning is established as a systematic process trying to optimize resources available towards the functionality most requested by customers and stakeholders.

Antirequisite(s): Credit for Software Engineering 622 and 607.25 will not be allowed.

Software Engineering 627 3 units; H(3-1)

Software Engineering Decision Support
Provides methodological foundations of software engineering decision-making and how to apply them to make better decisions about processes, products, and resources as well as for selection of tools and techniques.

Antirequisite(s): Credit for Software Engineering 627 and 625 will not be allowed.

Software Engineering 629 1.5 units; Q(3-0)

Software Engineering Standards and Models
Formal description of algorithms for current software engineering standards and models. Trends and future development in software engineering standardization.

Software Engineering 637 3 units; H(3-0)

Dependability and Reliability of Software Systems
Principles of software dependability techniques, and techniques to improve and predict software reliability.

Antirequisite(s): Credit for Software Engineering 637 and 521 will not be allowed.

Note: Engineering 319, Software Engineering 511, and Software Engineering 437 or 421, or their equivalents, are recommended as preparation for this course.

Software Engineering 639 3 units; H(3-0)

Advanced Software Testing
Advanced techniques, tools and concepts in software testing including: Agile testing, acceptance testing, GUI testing, test coverage analysis, automated testing, and new developments in testing research.

Note: Software Engineering 437 or equivalent is recommended as preparation for this course.

Software Engineering 641 3 units; H(3-0)
(formerly Computer Science 601.33)

Software Evolution and Reuse
Phenomena and approaches involved in the evolution and reuse of large-scale software, including design for modifiability and tool support. Strengths and weaknesses of industrially-current techniques as well as recent research results.

Antirequisite(s): Credit for Software Engineering 641 and 541 will not be allowed.

Note: Software Engineering 301 or equivalents are recommended as preparation for this course.

Software Engineering 652 6 units; F(3S-0)

Full-Course Project
A project in either software development or software best practice and experience.

Antirequisite(s): Credit for Software Engineering 652 and either 651 or Electrical Engineering 698 will not be allowed.

Note: This course is only available to MEng students with a specialization in Software Engineering. Students should register for this course in the semester when they will complete it.

Software Engineering 696 3 units; H(3-0)
(formerly Software Engineering 697)

Agent-Based Software Engineering
Principles and practices of engineering agent-based software systems.

Antirequisite(s): Credit for Software Engineering 696 and Computer Science 609 will not be allowed for programs offered by the Department of Computer Science.

Software Engineering for Engineers ENSF

Instruction offered by members of the Department of Electrical and Computer Engineering in the Schulich School of Engineering.

Senior Courses

Software Engineering for Engineers 409 3 units; H(3-2)

Principles of Software Development
A survey of software design and development topics for Engineering students. Topics include: key features of an object-oriented programming language, especially inheritance and polymorphism; elements of object-oriented design; programming and application of common data structures; strategies and tools for testing and debugging.

Prerequisite(s): Computer Engineering 339.

Antirequisite(s): Credit for Software Engineering for Engineers 409 and either Electrical Engineering 409 or Computer Engineering 493 will not be allowed.

Software Engineering for Engineers 519 3 units; H(3-2)

Special Topics in Software Engineering
Current topics in software engineering.

Prerequisite(s): Consent of the Department.

Note: Consult Department for announcement of topics.

MAY BE REPEATED FOR CREDIT

Software Engineering for Engineers 545 3 units; H(3-2)

Introduction to Virtual Reality
Introduce VR technologies. Emphasize on engineering methodologies of creating VR systems. Characterize VR systems, hardware and software, user 3D interaction, and VR applications and future.

Prerequisite(s): Software Engineering for Engineers 409.

Antirequisite(s): Credit for Software Engineering for Engineers 545 and 519.45 will not be allowed.

Graduate Courses

Registration in all courses requires the approval of the Department of Electrical and Computer Engineering.

Software Engineering for Engineers 603 3 units; H(3-0)

Modelling and Measurement of Software Performance
Performance-oriented review of computer systems; methodologies to evaluate software performance; fundamental performance laws; performance prediction using queuing network models; discrete event simulation of computer system performance, simulation input and output analysis; performance testing, monitoring and benchmarking; workload characterization; software performance engineering.

Antirequisite(s): Credit for Software Engineering 603 and 619.02 will not be allowed.

Software Engineering for Engineers 604 3 units; H(3-0)

Theoretical Foundations of Software Engineering
Explores formal principles of software engineering based on the common recognition that software engineering is not constrained by any physical laws as we know. The transdisciplinary foundations of software engineering are presented from the facets of information, computing, mathematics, cognitive, and management sciences, software engineering philosophies; engineering, mathematical, computational, management science, cognitive informatics, computational intelligence foundations and approaches of software engineering. As a result, a coherent framework of software engineering theories is learnt.

Antirequisite(s): Credit for Software Engineering for Engineers 604 and Software Engineering 609.19 will not be allowed.

Software Engineering for Engineers 619 3 units; H(3-1) or H(3-0)

Special Topics
A study of problems of particular interest to students specializing in Software Engineering.

MAY BE REPEATED FOR CREDIT

South Asian Studies SAST

Instruction offered under the direction of the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Junior Course

South Asian Studies 203 3 units; H(3-0)
(formerly South Asian Studies 315)

Understanding South Asia
The roots of ancient civilization; society, resources and environment; racial, ethnic and cultural diversities; philosophic and religious traditions; arts and aesthetics; historical bases of tradition and modernity; role of education in social development; ideological differences and economic development. Primary focus on India, Sri Lanka, Pakistan, Bangladesh, Bhutan and Nepal.

Senior Courses

South Asian Studies 303 3 units; (3-0)
(formerly South Asian Studies 415)

Contemporary Indian Society and Culture
This interdisciplinary course will discuss the culture and society of India today. Emphasis will be on casteism, communalism, religion, regionalism, globalization, ethnicity, class and gender in Indian society.

Prerequisite(s): South Asian Studies 203 or 315.

South Asian Studies 499 3 units; H(3-0)

Topics in South Asian Studies
Investigation of themes and methodologies related to the study of South Asian civilizations. A single theme, multiple themes or the study and application of one or more methods employed in Asian Studies may be offered. Themes/methods will vary among offerings.

499.01. Methods in South Asian Studies

499.02. Contemporary Issues in South Asia

499.03. Topics in the History of South Asia

Prerequisite(s): One of South Asian Studies 203, 303, 315 or 415.

South Asian Studies 531 3 units; H(3-0)

Supervised Research in South Asian Studies
An interdisciplinary, inquiry-based course in which students will pursue a supervised, independent research project on a topic from social, philosophical, economic, political and/or international issues within South Asia and analysis of the basis for

interactions among South Asian countries and across the Pacific will be presented in-depth.

Prerequisite(s): One of South Asian Studies 203, 303, 315 or 415 and consent of the Program Co-ordinator.

Antirequisite(s): Credit for South Asian Studies 531 and South Asian Societies 500 will not be allowed.

Space Physics SPPH

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Note: For listings of related courses, see Astronomy, Astrophysics, Medical Physics and Physics.

Graduate Course

Space Physics 671 **3 units; H(3-0)**

Physics of the Magnetosphere
Physics of the interaction between the earth's magnetic field and the fields and plasmas of the surrounding interplanetary environment. Topics include magnetic field models and co-ordinate systems, reconnection, current flow in the magnetosphere, substorms, and particle acceleration.

Prerequisite(s): Note: It is expected that a student's background will include Physics 509 and 555 or equivalent.

Spanish SPAN

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Arts.

Students are encouraged at all times to seek Departmental guidance in planning any aspect of their programs.

French, Italian and Spanish-speaking students or students with previous knowledge of these languages (including graduates of a bilingual or immersion program) must consult the Department to be placed in a course corresponding to their level of linguistic competence. Native speakers are not eligible to take language courses by special assessment or to receive advanced credit for them.

To register in Senior Courses (300 level and above), students must have completed Spanish 203 or 205, or have obtained the consent of the Department.

Not all Senior courses are offered every year. Current course offerings are listed in the Schedule of Classes.

Junior Courses

Spanish 201 **3 units; H(3-1)**

Beginners' Spanish I
A comprehensive course for students with no prior knowledge of the language. Includes training in listening, speaking, reading and writing of Spanish in its cultural context.

Antirequisite(s): Credit for Spanish 201 and 30 will not be allowed.

Spanish 203 **3 units; H(3-1)**

Beginners' Spanish II
A continuation of Spanish 201.

Prerequisite(s): Spanish 30, Spanish 201 or equivalent.

Antirequisite(s): Not open to students with credit in Spanish 205.

Spanish 205 **6 units; F(8-2)**

Intensive Spanish
A challenging task-oriented course, intended for students exiting high school with Spanish 30 or equivalent, Spanish 201 or previous knowledge of Spanish. This course will prepare students to transition to Spanish 303.

Prerequisite(s): Spanish 30, Spanish 201 or equivalent.

Antirequisite(s): Credit for Spanish 205 and either 203 or 301 will not be allowed.

Senior Courses

Spanish 301 **3 units; H(3-1T)**

Intermediate Spanish I
Further development of communication skills in Spanish (listening, speaking, writing), as well as the study of cultural issues in the Hispanic world with emphasis on reading.

Prerequisite(s): Spanish 203.

Antirequisite(s): Credit for Spanish 301 and 205 will not be allowed.

Spanish 303 **3 units; H(3-1T)**

Intermediate Spanish II
A continuation of Spanish 301.

Prerequisite(s): Spanish 301 or 205.

Spanish 321 **3 units; H(3-0)**

Contemporary Hispanic Cultures
Study of current issues in the Hispanic world as seen through various media sources such as newspapers, magazines, television and especially the web. Introduction to tools and resources for such study. Extensive reading, written work and oral presentations.

Prerequisite(s): Spanish 203 or 205.

Antirequisite(s): Not open to students with credit in 400-level Spanish courses or higher.

Spanish 323 **3 units; H(3-0)**

Introduction to Textual Analysis and Composition
Course designed to develop writing skills. Review of composition strategies, spelling, punctuation and argumentation using various original sources taken from journalistic, scientific, and literary texts as well as from other media.

Prerequisite(s): Spanish 301 or 205.

Antirequisite(s): Not open to students with credit in 400-level Spanish courses or higher.

Spanish 405 **3 units; H(3-0)**

High-Intermediate Spanish
Intensive study of Spanish grammar with the goal of attaining greater proficiency in written and oral communication. Grammatical analysis, vocabulary enrichment and development of conversation skills dealing with cultural issues.

Prerequisite(s): Spanish 303 and 323.

Spanish 407 **3 units; H(3-0)**

Critical Thinking in Spanish
Course designed to develop students' critical thinking skills and academic writing proficiency. Further development of reading and writing skills, through the analysis of selected texts and constant practice in writing expository and argumentative essays from outline to completion. Writing is seen as a process that includes many states of development, revision and editing.

Prerequisite(s): Spanish 303 and 323.

Spanish 421 **3 units; H(3-0)**

Introduction to Hispanic Prose
Analysis of selected Spanish and Spanish-American novels, short stories and essays, with an emphasis on literary analysis and literary history.

Prerequisite(s): Spanish 303 and 323.

Spanish 423 **3 units; H(3-0)**

Introduction to Hispanic Poetry and Drama
Analysis of Spanish and/or Spanish-American poetry and plays, with an emphasis on literary analysis and literary history.

Prerequisite(s): Spanish 303 and 323.

Spanish 437 **3 units; H(3-0)**

Spanish and Latin American Short Story
The analysis and interpretation of shorter fictional forms in Spain and Latin America, progressing from basic narrative techniques to the broad range of critical approaches to literary works. Strong emphasis will be placed on the understanding of the Hispanic cultures through literature and the development of critical thinking.

Prerequisite(s): Spanish 303 and 323.

Spanish 441 **3 units; H(3-0)**

Women's Perspectives
Literary, artistic and other cultural works produced by Spanish, Latin American, Caribbean and Latina women. A variety of topics and disciplines (film, art, photography, philosophy, etc.) will be examined. Class material will include theoretical and critical texts, primarily from feminism. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 303 and 323.

Spanish 471 **3 units; H(3-2)**

Hispanic Cinema
Study of Spanish, Latin American, Caribbean and Chicano cinema in its historical, political, and social context. Examines a variety of topics (national and gender identities, construction of myths, relations of cinema to popular culture, relations of cinema and literature, etc.). Use of contemporary theories of cinematographic expression. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 303 and 323.

MAY BE REPEATED FOR CREDIT

Spanish 473 **3 units; H(3-0)**

Hispanic Cultures
Overview of Hispanic history, literature and art. Use of essays, journalism, films and electronic media for classroom discussion. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 303 and 323.

MAY BE REPEATED FOR CREDIT

Spanish 475 **3 units; H(3-0)**

Topics in Spanish Language
Topics in Spanish phonology, dialectology, and other general aspects of the Spanish language. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 303 and 323.

MAY BE REPEATED FOR CREDIT

Spanish 499 **3 units; H(3-0)**

General Topics in Hispanic Studies
Discussion of selected topics in Hispanic language, literature or culture.

Prerequisite(s): Spanish 303 and 323.

MAY BE REPEATED FOR CREDIT

Spanish 505 **3 units; H(3-0)**

Advanced Spanish
Advanced course in Spanish language and culture with particular emphasis on composition, vocabulary building and linguistic accuracy. Includes a capstone interdisciplinary project to link the knowledge and skills learned from concentrations outside the Major (either another Major or a Minor) with those learned in the Major (Spanish).

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 523 **3 units; H(3-0)**

Translation
Introduction to the theory and practice of translation from Spanish into English and from English into Spanish. Format and content of course may vary from year to year to include other languages in addition to English.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 533 **3 units; H(3-0)**

Uses of Spanish as a Second Language
Introduction to basic issues related to the teaching of Spanish as a second language. In special circumstances the theoretical component may be taught in English. The practical component may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 553 **3 units; H(3-0)**
(formerly Spanish 433)

Spanish American Literature to 1900
A survey of Spanish American literature in its cultural and historical context. Includes the study of indigenous voices, literature of the conquest, as well as the colonial period and the major authors of the nineteenth century. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 555 **3 units; H(3-0)**

Spanish American Literature after 1900
Study of the major movements and authors of the twentieth century. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 557 **3 units; H(3-0)**

Current Trends in Hispanic Studies
In-depth study of literary and cultural issues which could include marginalization, identity, nationalism, the emergence of silenced voices, or other new developments. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 563 **3 units; H(3-0)**

Medieval Literature
Representative works of literature in the Spanish language from the tenth to the fifteenth centuries. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Antirequisite(s): Credit for Spanish 563 and 565 will not be allowed.

Spanish 567 **3 units; H(3-0)**

Early Modern Literature
Representative works of literature in the Spanish language from the sixteenth to the seventeenth centuries. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Antirequisite(s): Credit for Spanish 567 and 565 will not be allowed.

Spanish 571 **3 units; H(3-0)**

Art and Literature
Study of the interrelations of the visual arts and literature, using as its reference Hispanic literary texts and works of art. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 573 **3 units; H(3-2)**

Critical Analysis of Hispanic Cinemas
In-depth study of Hispanic Cinemas, including genres, movements, histories, industrial mechanisms of distribution, and cultural reception, in consolidated, developing and emerging film industries. Content can be organized based on region (Chicano/a, Mexican, Spanish cinema, etc.); topic (identity, transnationalism, women's cinema, etc.); genre (road movie, documentary, border cinema, auteur cinema, etc.); filmmakers and/or by identifiable traditions (cine de la movida, Nuevo cine latinomericano, New cinemas, etc.). Use of contemporary theories and study of cinematographic techniques.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 581 **3 units; H(3-0)**
(formerly Spanish 481)

Spanish Literature and Culture from the Eighteenth Century to the Spanish Civil War
Survey of major works and cultural movements from the eighteenth century to the early twentieth century. Focus on reading and analytical skills. Format and content of the course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 583 **3 units; H(3-0)**

Spanish Literature and Culture from the Spanish Civil War to the Present
Interdisciplinary course stressing the relationship between various cultural manifestations and their sociopolitical background. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Spanish 593 **3 units; H(3-0)**

Literary Theory
An introduction to modern literary theory and its various schools of thought, with application to works of Hispanic literature.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

Note: This course is mandatory for students registered in the Spanish Honours Program.

MAY BE REPEATED FOR CREDIT

Spanish 598 **6 units; F(0-3T)**

Honours Thesis
Prerequisite(s): Consent of the Department.

Note: Restricted to Spanish Honours students. The thesis must be written in Spanish.

Spanish 599 **3 units; H(3-0)**

Advanced Topics in Hispanic Studies
A specialized course for advanced students. Course may function as a seminar or as a directed readings course.

Prerequisite(s): Spanish 405 and 9 units (1.5 full-course equivalents) in Spanish at the 400 level.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Note: The Department will give graduate credit for 500-level courses in cases it deems exceptional. This option is subject to the approval of the Department. Graduate students taking a 500-level course for graduate credit will be asked to complete additional requirements.

Spanish 601 **3 units; H(3-0)**

Literary and Cultural Theory
MAY BE REPEATED FOR CREDIT

Spanish 613 **3 units; H(3-0)**

Critical Analysis of Medieval Texts
MAY BE REPEATED FOR CREDIT

Spanish 615 **3 units; H(3-0)**

Golden Age Literature
MAY BE REPEATED FOR CREDIT

Spanish 617 **3 units; H(3-0)**

Theatre and Performance in the Nineteenth or Twentieth Centuries
MAY BE REPEATED FOR CREDIT

Spanish 619 **3 units; H(3-0)**

Post-Franco Literature, Art and Film
MAY BE REPEATED FOR CREDIT

Spanish 621 **3 units; H(3-0)**

Art, Film and Literature in the Spanish Avant-Garde
MAY BE REPEATED FOR CREDIT

Spanish 623 **3 units; H(3-0)**

Spanish American Literature and Culture to 1900
MAY BE REPEATED FOR CREDIT

Spanish 625 **3 units; H(3-0)**

Twentieth Century Spanish American Literature
MAY BE REPEATED FOR CREDIT

Spanish 627 **3 units; H(3-0)**

Avant-Garde Movements in Spanish America
MAY BE REPEATED FOR CREDIT

Spanish 631 **3 units; H(3-0)**

Popular Culture
MAY BE REPEATED FOR CREDIT

Spanish 633 **3 units; H(3-0)**

Writings in Exile
MAY BE REPEATED FOR CREDIT

Spanish 635 **3 units; H(3-0)**

Literature and the Visual Arts in Hispanic Culture
MAY BE REPEATED FOR CREDIT

Spanish 637 **3 units; H(3-0)**

Identities and Post-Colonial Voices
MAY BE REPEATED FOR CREDIT

Spanish 639 **3 units; H(3-0)**

Hispanic Female Voices
MAY BE REPEATED FOR CREDIT

Spanish 641 **3 units; H(3-0)**

Hispanic Cinema
MAY BE REPEATED FOR CREDIT

Spanish 643 **3 units; H(3-0)**

Special Topics in Hispanic Culture, Language or Literature
MAY BE REPEATED FOR CREDIT

Statistics STAT

Instruction offered by members of the Department of Mathematics and Statistics in the Faculty of Science.

Notes:

Not every 400- and 500-numbered Statistics course is offered every year. Check with the divisional office to plan for the upcoming cycle of offered courses.

For listings of related courses, see Actuarial Science, Applied Mathematics, Mathematics, and Pure Mathematics.

Credit towards degree requirements will be given for only one of Engineering 319, Political Science 399, Psychology 312, Sociology 311, Statistics 205, 213 and 217, 327; that one being a course(s) appropriate to the degree program.

Statistics 205, 213, 217, 327 are not available to students who have previous credit for one of Mathematics 321 or Statistics 321 or are concurrently enrolled in Mathematics 321 or Statistics 321.

Effective Fall 2014, Mathematics 265, 267, 367, Mathematics 275, 277, 375 and 377 replaced respectively Mathematics 251, 253, 353, Applied Mathematics 217, 219, 307 and 309 and serves as prerequisites for appropriate courses. In some special cases, Mathematics 267 replaces Mathematics 349 or 353. For these and other deviations from the general rule, see individual course entries for details. Mathematics 267 supplemented by Mathematics 177 will be accepted as equivalent to Mathematics 277.

Junior Courses

Students requiring one course (3 units) in Statistics should take Statistics 205.

Statistics 205 **3 units; H(3-1T)**

Introduction to Statistical Inquiry
The systematic progression of statistical principles needed to conduct a statistical investigation culminating in parameter estimation, hypothesis testing, statistical modelling, and design of experiments.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education) or registration in the Faculty of Nursing.

Antirequisite(s): Credit for Statistics 205 and either 211 or 213 will not be allowed.

Note: See the statements regarding credit which appear at the beginning of the Statistics course listings. This course is highly recommended for Statistics Majors.

Statistics 213 **3 units; H(3-1-1T)**

Introduction to Statistics I
Collection and presentation of data, introduction to probability, including Bayes' law, expectations and distributions. Properties of the normal curve. Introduction to estimation and hypothesis testing.

Prerequisite(s): Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education).

Note: See the statements regarding credit which appear at the beginning of the Statistics course listings.

Statistics 217 **3 units; H(3-1-1T)**

Introduction to Statistics II
Estimation of population parameters; confidence intervals for means; choice of sample size. Tests of hypotheses including 2-sample tests and paired comparisons. The Chi-squared tests for association and goodness-of-fit. Regression and correlation; variance estimates; tests for regression and correlation coefficients. Non-parametric methods and associated tests. Time series, forecasting.

Prerequisite(s): Statistics 213.

Note: See the statements regarding credit which appear at the beginning of the Statistics course listings.

Senior Courses

Statistics 321 **3 units; H(3-1T)**
(formerly Mathematics 321)

Introduction to Probability
A calculus-based introduction to probability theory and applications. Elements of probabilistic modelling, Basic probability computation techniques, Discrete and continuous random variables and distributions, Functions of random variables, Expectation and variance, Multivariate random variables, Conditional distributions, Covariance, Conditional expectation, Central Limit Theorem, Applications to real-world modelling.

Prerequisite(s): Mathematics 267 or 277 or 253 or 283 or Applied Mathematics 219.

Note: Statistics 205 is strongly recommended as preparation for this course for Statistics majors.

Statistics 323 **3 units; H(3-1T)**
(formerly Mathematics 323)

Introduction to Theoretical Statistics
Statistics and their distributions. Introduction to statistical inference through point estimation and confidence interval estimation of a population parameter. Properties of statistics including unbiasedness and consistency in estimation. Single parameter hypothesis testing, Type I and Type II Errors. Multi-parameter estimation through confidence interval estimation and hypothesis testing. The analysis of bivariate data through simple linear regression, including inferences on the parameters of the linear model and the analysis of variance.

Prerequisite(s): Mathematics 321 or Statistics 321.

Note: Prior or concurrent completion of Mathematics 353 or 381 is strongly recommended for students without credit of Mathematics 267 or 277.

Statistics 327 **3 units; H(3-1)**

Statistics for the Physical and Environmental Sciences
Introduction to the collection of data. Probability and probability distributions. Single and Multi-sample estimation of distribution parameters. Regression and Goodness of Fit tests. Experimental Design and Analysis of Variance.

Prerequisite(s): Mathematics 249 or 251 or 265 or 275 or 281 or Applied Mathematics 217.

Note: See the statements regarding credit which appear at the beginning of the Statistics course listings.

Statistics 421 **3 units; H(3-0)**

Mathematical Statistics
An advanced examination of core concepts in mathematical statistics, including the multivariate normal distribution, limit distributions, sufficient statistics, completeness of families of distributions, exponential families, likelihood ratio tests, chi-square tests, and the analysis of variance. Additional topics and examples relating to sequential tests, non-parametric methods, Bayesian statistical modelling, and the general linear model may also be explored.

Prerequisite(s): Statistics 323 or Mathematics 323; and Mathematics 267 or 277 or 353 or 381.

Statistics 423 **3 units; H(3-1T)**

Statistical Analysis of Sample Survey
Introduction to questionnaire design of sample surveys. Treatment of the various sampling methodologies used in population parameter estimation. Ratio and regression estimation. Sampling weights and variance estimation of statistics. Estimation of population size and density. Non-response.

Prerequisite(s): One of Statistics 217, 323, 327, Engineering 319, Psychology 312, or Sociology 311.

Statistics 425 **3 units; H(3-1T)**

Statistical Design and Analysis of Experiments
Introduction to the design of experiments and the statistical analysis of data. Analysis of variance in the response variable and adequacy of the model. Multiple comparison methods. Extensions to completely randomized block, latin-squares, and factorial experimental design. Introduction to nested and split-plot design, with emphasis on statistical software usage.

Prerequisite(s): One of Statistics 217, 323, 327, Engineering 319, Psychology 312, or Sociology 311.

Statistics 429 **3 units; H(3-1T)**

Linear Models and Their Applications
Multiple linear regression model, parameter estimation, simultaneous confidence intervals and general linear hypothesis testing. Residual analysis and outliers. Model selection: best regression, stepwise regression algorithms. Transformation of variables and non-linear regression. Applications to forecasting. Variable selection in high-dimensional data using linear regression. Computer analysis of practical real world data.

Prerequisite(s): Statistics 323 or Mathematics 323; and Mathematics 211 or 213.

Statistics 431 **3 units; H(3-1T)**

Introduction to Biostatistics
Fundamental topics in biostatistics, including descriptive statistics, graphical presentation of data, analysis of variance (ANOVA), study designs, contingency tables, measures of association, tests of significance, categorical data analysis, regression, time to event data analysis.

Prerequisite(s): Statistics 323 or Mathematics 323.

Statistics 505 **3 units; H(3-1T)**

Time Series Analysis
An introduction to the theory and tools to conduct time series analysis, with the emphasis on modelling and forecasting using a software. Stationarity, white noise, autocorrelation, partial autocorrelation, and linear predictor. Stationary ARIMA models, seasonality and trends. Model fitting, diagnostics and forecasting. Additional topics may include state space models, spectral analysis of time series, and GARCH models.

Prerequisite(s): Statistics 429.

Statistics 507 **3 units; H(3-0)**
(formerly Statistics 407)

Introduction to Stochastic Processes
Markov chains. Limit distributions for ergodic and absorbing chains. Classification of states, irreducibility. The Poisson process and its generalizations. Continuous-time Markov chains. Brownian motion and stationary processes. Renewal theory.

Prerequisite(s): Mathematics 321 or Statistics 321.

Statistics 517 **3 units; H(3-1)**

Practice of Statistics
A capstone course intended for students in their final year of study. The emphasis is on how to address real world scientific and social issues by applying the various statistical methods acquired in the earlier years in a unified and appropriate way. This involves method selection, data handling, statistical computing, consulting, report writing and oral presentation, team work, and ethics.

Prerequisite(s): Two of Statistics 423, 425, 429 and 505.

Antirequisite(s): Credit for Statistics 517 and either 513 or 515 will not be allowed.

Statistics 519 **3 units; H(3-0)**

Bayesian Statistics
Fundamentals of Bayesian inference, single and multiparameter models, hierarchical models, regression models, generalized linear models, advanced computational methods, Markov chain Monte Carlo.

Prerequisite(s): Statistics 323 or Mathematics 323; and Mathematics 267 or 277 or 353 or 381.

Note: Completion of Statistics 421 is highly recommended as preparation for this course.

Statistics 523 **3 units; H(3-0)**

Non-parametric Statistics
Non-parametric estimation and tests of hypotheses. Distribution-free tests. Asymptotic Theory. Re-sampling method and density estimation.

Prerequisite(s): Statistics 323 or Mathematics 323; and Mathematics 267 or 277 or 353 or 381.

Note: May not be offered every year. Consult the department for listings.

Statistics 525 **3 units; H(3-0)**

Applied Multivariate Analysis
Normal distribution. Statistical inference: confidence regions, hypothesis tests, analysis of variance, simultaneous confidence intervals. Multivariate statistical methods; principal components, factor analysis, discriminant analysis and classification, canonical correlation analysis, cluster analysis.

Prerequisite(s): Statistics 323.

Note: May not be offered every year. Consult the department for listings. Completion of Mathematics 311 or 313 is highly recommended as preparation for this course.

Statistics 529 **3 units; H(3-1)**

Special Topics in Applied Statistics
Content of the course will vary from year to year. Consult the Department for information on choice of topics.

Prerequisite(s): Consent of the Department.

MAY BE REPEATED FOR CREDIT

Statistics 531 **3 units; H(3-1)**

Monte Carlo Methods and Statistical Computing
Introduction to statistical computing; random numbers generation; Monte Carlo methods (variance reduction technique; computation of definite integrals); Optimizations; Numerical integrations.

Prerequisite(s): Statistics 323 or Mathematics 323; and Mathematics 267 or 277 or 353 or 381.

Statistics 533 **3 units; H(3-1T)**
(formerly Statistics 433)

Survival Models
Nature and properties of survival models; methods of estimating tabular models from both complete and incomplete data samples including actuarial, moment and maximum likelihood techniques; estimations of life tables from general population data; Kaplan-Meier estimator and Nelson-Allan estimator; the accelerated failure time model; the Cox proportional hazards model; model building and high-dimensional survival data analysis.

Prerequisite(s): Statistics 323 or Mathematics 323.

Statistics 541 **3 units; H(3-1T)**

Categorical Data Analysis
Description and inference for binomial and multinomial observations using proportions and odds ratios; multi-way contingency tables; generalized linear models for discrete data; logistic regression for binary responses; multi-category logit models for nominal and ordinal responses; loglinear models, and inference for matched-pairs and correlated clustered data.

Prerequisite(s): Statistics 429.

Graduate Courses

Note: Some 500- and 600-level statistics courses may have concurrent lectures. Extra work in these courses (e.g., extra assignments, advanced examination questions, a term project) will be required for credit at the 600 level.

Statistics 600 **1.5 units; Q(3S-0)**
(formerly Statistics 621)

Research Seminar
A professional skills course, focusing on the development of technical proficiencies that are essential for students to succeed in their future careers as practicing statistician in academia, government, or industry. The emphasis is on delivering professional presentations and using modern statistical research tools. A high level of active student participation is required.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Statistics 601 **3 units; H(3-0)**

Topics in Probability and Statistics
The content of this course is decided from year to year in accordance with graduate student interest and instructor availability. Topics include but are not restricted to: Advanced Design of Experiments, Weak and Strong Approximation Theory, Asymptotic Statistical Methods, the Bootstrap and its Applications, Generalized Additive Models, Order Statistics and their Applications, Robust Statistics, Statistics for Spatial Data, Statistical Process Control, Time Series Models.

MAY BE REPEATED FOR CREDIT

Statistics 603 **3 units; H(3-1)**
(formerly Statistics 601.14)

Applied Statistics for Nursing Research
Descriptive statistics; probability theory; statistical estimation/inference; power analysis; regression analysis; anova; logistic regression analysis; non-parametric tests; factor analysis; discriminant analysis; Cox's Proportional Hazard Model.

Statistics 619 **3 units; H(3-0)**

Bayesian Statistics
Fundamentals of Bayesian inference, single and multiparameter models, hierarchical models, regression models, generalized linear models, advanced computational methods, Markov chain Monte Carlo.

Statistics 625 **3 units; H(3-0)**

Multivariate Analysis
Normal distribution. Statistical inference: confidence regions, hypothesis tests, analysis of variance, simultaneous confidence intervals. Principal components. Factor Analysis. Discrimination and classification. Canonical correlation analysis.

Statistics 633 **3 units; H(3-0)**

Survival Models
Advanced topics in survival models such as the product limit estimator, the cox proportional hazards model, time-dependent covariates, types of censorship.

Statistics 635 **3 units; H(3-0)**

Generalized Linear Models
Exponential family of distributions, binary data models, loglinear models, overdispersion, quasi-likelihood methods, generalized additive models, longitudinal data and generalized estimating equations, model adequacy checks.

Statistics 637 **3 units; H(3-0)**

Non-linear Regression
Topics include but are not restricted to selections from: linear approximations; model specification; various iterative techniques; assessing fit; multiresponse parameter estimation; models defined by systems of differential equations; graphical summaries of inference regions; curvature measures.

Statistics 639 **3 units; H(3-0)**

Conference Course in Actuarial Modelling
Topics in advanced actuarial theory and practice, such as: insurance risk models; practical analysis of extreme values; advanced property and casualty rate making; actuarial aspects of financial theory.

MAY BE REPEATED FOR CREDIT

Statistics 701 **3 units; H(3-0)**

Theory of Probability I
Probability spaces, integration, expected value, laws of large numbers, weak convergence, characteristic functions, central limit theorems, limit theorems in Rd, conditional expectation, introduction to martingales.

Prerequisite(s): Statistics 321 or Mathematics 321; and Mathematics 353 or 367 or 381.

Statistics 703 **3 units; H(3-0)**

Theory of Probability II
Stopping times, renewal theory, martingales, almost sure convergence, Radon-Nikodym

derivatives, Doob's inequality, square integrable martingales, uniform integrability, Markov chains, stationary measure, Birkhoff's Ergodic Theorem, Brownian motion, stopping times, hitting times, Donsker's Theorem, Brownian bridge, laws of the iterated logarithm.

Prerequisite(s): Statistics 701.

Statistics 721 **3 units; H(3-0)**

Theory of Estimation
Likelihood function and likelihood principle, sufficiency, completeness of exponential families, Cramer-Rao lower bound, Lehmann-Scheffe Theorem, Rao-Blackwell Theorem, estimation methods, basic asymptotic theory, consistent asymptotic normal estimators (CAN), asymptotic properties of the maximum likelihood estimators, Bayesian estimation.

Prerequisite(s): Statistics 323 or Mathematics 323; and Mathematics 353 or 367 or 381.

Statistics 723 **3 units; H(3-0)**

Theory of Hypothesis Testing
Likelihood ratio (LR), union-intersection, most powerful, unbiased and invariant tests, Neyman-Pearson Lemma, Karlin-Rubin Theorem, confidence interval (CI), pivotal quantities, shortest length and shortest expected length CI, uniformly most accurate CI, confidence region, simultaneous CI, large-sample tests (Wald's, score, LR tests), Bayesian hypothesis testing, analysis of variance and linear models.

Prerequisite(s): Statistics 721.

Strategic Studies STST

Instruction offered by members of the Faculty of Arts.

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Strategic Studies 601 **3 units; H(4 months)**

MSS First Term Co-operative Education
Strategic Studies first term co-operative education work placement.

Prerequisite(s): Admission to the co-operative education option of the MSS program.

NOT INCLUDED IN GPA

Strategic Studies 602 **3 units; H(4 months)**

MSS Second Term Co-operative Education
Strategic Studies second term co-operative education work placement.

Prerequisite(s): Admission to the co-operative education option of the MSS program.

Strategic Studies 603 **3 units; H(3-0)**

Questions and Methods
A Block Week introduction to research design and methods in Military and Strategic Studies. Introduces the field, its history, major methodological debates and challenges of interdisciplinary research.

Prerequisite(s): Admission to Military and Strategic Studies graduate program.

NOT INCLUDED IN GPA

Strategic Studies 609 **3 units; H(3-0)**

The Canadian Military in the Second World War
An examination of the political parameters imposed by the Canadian government, the quality of Canadian leadership, and the "fit" between British forms of military organization and the fighting quality of Canadian soldiers, sailors and airmen.

Strategic Studies 611 **3 units; H(3-0)**

Canadian Military Studies
Canadian military studies, excepting the two world wars. Topics will include the evolution of Canadian defence policy, past or present, the development and evolution of the Canadian Forces or any of its main elements (army, navy or air force), Canadian military operability with the military forces of Allied nations, and the relationship between Canadian foreign policy and the use of the Canadian military.

Strategic Studies 613 **3 units; H(3S-0)**

The Canadian Military in the First World War
The development and operational achievements of the Canadian Expeditionary Force, wartime civil-military relations and conscription politics.

Antirequisite(s): Credit for Strategic Studies 613 and History 520 will not be allowed.

Strategic Studies 649 **3 units; H(3S-0)**

Special Topics in Military and Strategic Studies
MAY BE REPEATED FOR CREDIT

Strategic Studies 651 **3 units; H(3-0)**

Reading Seminar
Prerequisite(s): Permission of the Graduate Coordinator.

MAY BE REPEATED FOR CREDIT

Strategic Studies 653 **3 units; H(3-0)**

Research Seminar
Prerequisite(s): Permission of the Graduate Coordinator.

MAY BE REPEATED FOR CREDIT

Strategic Studies 655 **3 units; H(3-0)**
(formerly History 655)

Classics of Strategy
Strategic thought from Sun Tzu to Clausewitz, Mahan to Corbett. Analyzes the writings of classic strategic thinkers and then, by way of case studies, examines their theories as they pertain to military and political planners from the Peloponnesian War to the present.

Strategic Studies 657 **3 units; H(3-0)**

Intelligence; Information Operations; and "Command, Control, Communications and Computers"
An assessment of the history of intelligence, information operations, and command systems for military and diplomatic institutions as well as contemporary theory and practice related to these issues.

Strategic Studies 659 **3 units; H(3-0)**

Sea Power
The meaning of sea power and an assessment of how modern states use it. An analysis of the writings of major naval strategic thinkers and case-study examination of the application of those theories from Nelson to the present.

Strategic Studies 662 **3 units; H(3S-0)**

Advanced Studies in Canadian Arctic Security
The Canadian Arctic is an emerging area of concern due to changes scarcely imaginable even a few years ago. Examines the nature of some of these changes – e.g. climate change and the northern seas' dramatically changing ice conditions, growing recognition of the region's resource wealth, and evolving international relations in the circumpolar region – and what they mean for Canadian Arctic Security.

Strategic Studies 663 **3 units; H(3S-0)**

Wars – Causes and Aftermaths
An examination of the complexity and experience of conflict and war as well as the broader institutions that govern post-conflict recovery and transition in the twentieth and twenty first centuries. Special attention will be paid to the methodological complexities of studying violence.

Strategic Studies 751 **3 units; H(3-0)**

Reading Seminar
Prerequisite(s): Permission of the Graduate Coordinator.

MAY BE REPEATED FOR CREDIT

Strategic Studies 753 **3 units; H(3-0)**

Research Seminar
Prerequisite(s): Permission of the Graduate Coordinator.

MAY BE REPEATED FOR CREDIT

Strategy and Global Management SGMA

Instruction offered by members of the Haskayne School of Business.

Junior Course

Strategy and Global Management 217 **3 units; H(3-3)**

Introduction to Business Skills
Introduction to the external business environment, human resource management, and marketing. Topics will include ethical decision-making, teamwork, secondary research, proper use of business communication tools and presentation skills. Pedagogical approaches may include case analysis, exercises, simulations, and class discussion.

Prerequisite(s): Admission to the Haskayne School of Business Bachelor of Commerce program.

Antirequisite(s): Credit for Strategy and Global Management 217 and Business and Environment 291 will not be allowed.

Senior Courses

Strategy and Global Management 559 **3 units; H(3-0)**

Selected Topics in Strategy and Global Management
Examination of selected topics in Strategy and Global Management.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

MAY BE REPEATED FOR CREDIT

Strategy and Global Management 571 **3 units; H(3-0)**

Business Under Nafta
Legal, political, economic and social considerations important to Canadian firms pursuing the US and/or Mexican markets, including the implications of the North American Free Trade Agreement.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Strategy and Global Management 573
3 units; H(3-0)

Business with Japan
An integrated approach to the cultural, governmental and structural factors influencing the conduct of business with Japan, whether as a supplier, customer, partner or investor.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Strategy and Global Management 575
3 units; H(3-0)

International Business
Covers the concepts and knowledge base required to understand how foreign cultural, economic and political developments affect the strategies of firms involved in international trade and investment, as well as of firms often seen as principally domestic in orientation.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Strategy and Global Management 577
3 units; H(3-0)
(formerly Strategy and Global Management 559.01)

International Strategic Management
A focus on why and how firms internationalize and the strategic challenges facing firms that operate within an international business environment. The course covers key concepts, theories and perspectives in international management. These are critiqued, contextualized and applied to particular firm level cases.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Strategy and Global Management 579
3 units; H(3-0)
(formerly Strategy and Global Management 559.02)

Co-ordinating Global Business
Applies international business theory to the practical operational challenges faced by international managers with a focus on functional implications throughout the entire value chain of the firm's cross-border activities.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Note: A basic understanding of the international business environment and international strategic management is assumed.

Strategy and Global Management 591
3 units; H(3-0)

Strategic Management
Analysis of competitive situations from the general management point of view, including fit between key environmental forces and the firm's resources, and changes in these over time. Formulating and implementing strategy based on that analysis. Developing and leveraging a firm's core competencies to gain long-term sustainable advantage.

Prerequisite(s): Admission to the Haskayne School of Business and 84 units (14.0 full-course equivalents) including Accounting 217 or 317, Accounting 323, Business and Environment 395, Communications Studies 363 or 369 or Entrepreneurship and Innovation 317, Management Studies 391, Human Resources and Organizational Dynamics 317, Business Technology Management 317, Finance 317, Marketing 317, Operations Management 317.

Graduate Courses

Strategy and Global Management 601
3 units; H(3-0)
(formerly Strategy and Global Management 701)

Strategic Management I
The role of the CEO and other senior executives in formulating and implementing corporate strategies, and provides an overview of key strategic issues and topics. Covers such areas as industry analysis, executive leadership, corporate strategy, corporate diversification, strategic change, global strategy, mergers and acquisitions, and strategic implications of new technologies.

Antirequisite(s): Credit for Strategy and Global Management 601 and 701 will not be allowed.

Strategy and Global Management 725
3 units; H(3-0)

e-Strategy
The impact of Internet technology on strategic management of large corporations. How the technology influences industry structure and how it drives companies' competitive strategies and their organizational structures and systems. Explores the implications for strategic leadership in organizations.

Corequisite(s): Business Technology Management 725.

Strategy and Global Management 751
3 units; H(3-0)

Strategic Management in the Global Energy Industry
Characteristics of the energy industry. Major strategic issues facing top management teams in corporations involved in oil and gas and power businesses and relevant strategic tools for addressing them. Industry structure, energy value chain, key players and their strategies, industry dynamics and trends, supply and demand, expansion, M&As, roles of governments, OPEC and international politics, Kyoto Protocol, major technological drivers, organization and top management leadership.

Corequisite(s): Strategy and Global Management 601.

Strategy and Global Management 775
3 units; H(3-0)

International Business Environment
The environment which influences international business activities including economic, legal, political and socio-cultural factors. Foreign direct investment in Canada will also be considered.

Strategy and Global Management 789
3 units; H(3S-0)

Seminar in Strategy and Global Management
Study and discussion of current research literature and contemporary issues on topics related to Strategy and Global Management in the private and/or the public sectors.

MAY BE REPEATED FOR CREDIT

Strategy and Global Management 795
3 units; H(3-0)

Strategic Management II
Application of strategic concepts and frameworks of analysis. Decisions and the processes to mobilize resources for the attainment of objectives. Measurement of performance through industry and competitive analysis.

Prerequisite(s): Strategy and Global Management 601 or consent of the Haskayne School of Business.

Strategy and Global Management 796
3 units; H(3-0)

Qualitative Research in Strategy and Organizations
Processes of collecting, analysing, and reporting qualitative data, as well as inducing theory from them. Application to the area of Strategy and Organizations is emphasized. Focus on various approaches to qualitative research and on developing competence in conducting it.

Prerequisite(s): Consent of the Haskayne School of Business.

Strategy and Global Management 797
3 units; H(3S-0)

Advanced Seminar in Strategy and Global Management
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

PhD Course

Strategy and Global Management 799
3 units; H(3S-0)

Doctoral Seminars in Strategy and Global Management
799.01. Survey of the Field

799.02. Corporate and Competitive Strategy

799.03. Current Topics in Strategic Management

799.04. Business Environment

799.05. Interorganizational Relationships: Creating and Managing Strategic Alliances

Sustainable Energy Development SEDV

Instruction offered by members of the Faculties of Environmental Design, Law, Schulich School of Engineering and the Haskayne School of Business.

Note: Enrolment is limited to students admitted to the MSc in Sustainable Energy Development program, or approved by the Director of the Sustainable Energy Development Program.

Graduate Courses

Sustainable Energy Development 601
3 units; H(3-0)

Energy Systems I: Non-Renewable Energy
Interactions between non-renewable energy resources and the environment; Exploration, production and exploitation of energy resources, including petroleum, oil sands, natural gas, coal, nuclear, coal-bed methane; Technical, economic and environmental aspects of production and use of non-renewable energy.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 603
3 units; H(3-0)

Energy Systems II: Renewable Energy
Renewable energy sources leading to global sustainable energy infrastructure: wind, hydro, solar photovoltaic, solar heat collection, geothermal, biomass, cogeneration; System level physical modelling; Steady-state turbine operation; Introductory thermodynamics; Economic tools, such as levelized cost of energy analysis.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 605
3 units; H(3-0)

Ecology, Sustainable Development and Indigenous Cultures
Inter-relationships between ecological systems, sustainability and aboriginal cultures; Review of government policies with regard to environmental issues; Case-based analysis of selected issues and strategic management mechanisms for dealing with aboriginal concerns in resource project development and the approval process; Aboriginal law and its relation to resource development.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 607
3 units; H(3-0)

Water Pollution and its Impact on the Energy Sector
Causes and consequences of water pollution; Technologies for prevention, mitigation and control of pollutant effluents including those related to energy projects; Water usage and management in energy development.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 609
3 units; H(3-0)

Air Pollution and its Impact on the Energy Sector
Causes and consequences of air pollution; Technologies for prevention, mitigation and control of pollutant emissions including those related to energy projects; Greenhouse gas emissions and their impact on global warming.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 611
3 units; H(3-0)

Land Pollution and Waste Management in the Energy Sector
Causes and consequences of land pollution; Technologies for prevention, minimization, mitigation and control of pollution from solid waste including those related to energy projects; Management of contaminated sites; Waste to energy practices.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 613
3 units; H(3-0)

Energy Systems III: Planning and Energy Economics
Financial principles and evaluation techniques; Application to energy investment planning and to assessment of foundations in energy economics and policies; Financial decision-making tools to support environmental and social initiatives, programs, investments and projects.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 615
3 units; H(3-0)

Environmental Impact Assessment in the Energy Sector
Principles and professional practice of environmental impact assessment, with application to energy development projects.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 617
3 units; H(3-0)

Human Resource and Management in the Energy Sector
Major concepts and theories of management and organizational dynamics as they impact on the energy sector; Interpersonal effectiveness and self-awareness, motivation, group dynamics, project teams, supportive communication, stress, leadership, power, influence and conflict, organizational culture, processes of change.

Prerequisite(s): Admission to the Sustainable Energy Development Program only or consent of the Program Director.

Sustainable Energy Development 619
3 units; H(3-0)

Environmental Law in the Energy Sector
Legal systems, nature and sources; International environmental law and its implementation; Fundamental legal concepts including jurisdiction, procedural fairness, liability, property and contract; Environmental regulatory systems and alternative instruments; Judicial review; Enforcement and compliance; Alternative dispute resolution.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 621
3 units; H(3-0)

Environmental Management Tools in the Energy Sector
Implementing strategy through environmental management systems, including tools and methods to achieve environmental goals from compliance of laws and regulations to leadership in environmental innovation; Tools and methods explored include policies, structures, indicators, audits, and reporting.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 623
3 units; H(3-0)

Strategic Environmental Planning for Energy Organizations
A strategic approach to managing environmental and social issues facing energy industry and its economic rationale in a competitive global energy market.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 625
3 units; H(3-0)

Research Project
An introduction to research methodology; Environmental issues with energy projects; Demonstration of knowledge and skills through a comprehensive interdisciplinary project completed individually or in small groups.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 631
3 units; H(3-0)

Life Cycle Assessment in the Energy Sector
The concept of life cycle assessment (LCA) as it applies to energy production and consumption from an environmental and sustainability perspective; Use of LCA to support informed decision-making for improved environmental performance of energy projects and for avoiding problem-shifting and sub-optimization.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Antirequisite(s): Credit for Sustainable Energy Development 631 and Sustainable Energy Development 699.03 will not be allowed.

Sustainable Energy Development 699
3 units; H(3-0)

Topics in Energy and the Environment
Study of selected topics related to energy and the environment and related subjects. Specific course(s) will reflect changing needs and faculty interests.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

MAY BE REPEATED FOR CREDIT

Term Abroad Program TAP

Instruction offered by the University and individual Faculties depending on the topic(s) being covered.

Junior Courses

Term Abroad Program 201 **3 units; H(3-0)**

National Language I
Instruction in the Language (or one of the languages) of the country of residence as part of a Term Abroad Program.

Term Abroad Program 203 **3 units; H(3-0)**

National Language II
A continuation of Term Abroad Program 201.

Prerequisite(s): Term Abroad Program 201 or consent of the Faculty of Arts.

Senior Courses

Term Abroad Program 301 **3 units; H(3-0)**

National Language Intermediate I
A continuation of Term Abroad Program 203.

Prerequisite(s): Term Abroad Program 203 or consent of the Faculty of Arts.

Term Abroad Program 303 **3 units; H(3-0)**

National Language Intermediate II
A continuation of Term Abroad Program 301.

Prerequisite(s): Term Abroad Program 301 or consent of the Faculty of Arts.

Tourism Management TOUR

Instruction offered by members of the Haskayne School of Business.

Senior Courses

Tourism Management 309 3 units; H(3-0)

Introduction to Leisure, Tourism and Society
An interdisciplinary introduction to the concepts, methods and practices of leisure, recreation and tourism studies.

Prerequisite(s): Admission to the Haskayne School of Business and 30 units (5.0 full-course equivalents).

Antirequisite(s): Credit for Tourism Management 309 and 409 will not be allowed.

Tourism Management 409 3 units; H(3-0)

Travel and Tourism Management
Economic, social, cultural, political, and technological dimensions of tourism, in particular changing travel markets, industry structure, evolving issues and problems.

Prerequisite(s): 60 units (10.0 full-course equivalents).

Antirequisite(s): Credit for Tourism Management 409 and 309 will not be allowed.

Note: Not available for credit toward the Bachelor of Commerce program. Preference in enrolment is given to students who have declared a Management and Society Minor.

Tourism Management 419 3 units; H(3-0)

Tourism Marketing
Examination of the travel industry structure, the peculiarities of the tourism "product", market trends, problems and prospects. Tourism demand, supply, and linking components are highlighted, with special emphasis on travel industry marketing in the broader community and regional marketing context and the integration of human resources management and marketing in service operations.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents) including Marketing 317 and Tourism Management 309.

Tourism Management 429 3 units; H(3-0)

Leadership and Human Resources in Tourism and Hospitality Operations
Analysis of the human resource management problems involved in the delivery of hospitality and travel services including recruitment, selection, training and development, motivation, compensation, communication, unionism and labour market issues. Emphasis will be on leadership and the linkages with human resources strategy and overall business objectives.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents).

Corequisite(s): Human Resources and Organizational Dynamics 317 and Tourism Management 309.

Tourism Management 439 3 units; H(3-0)

Financial Management in Tourism and Hospitality
Application of principles of financial management to the tourism and hospitality industry: balance sheet analysis; ratios; statements; capital budgeting analysis; franchising; management contracts; leasing; financing; and revenue management.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents) including Finance 317 and Tourism Management 309.

Note: Tourism Management 469 is recommended.

Tourism Management 449 3 units; H(3-0)

Policy, Planning and Research in Tourism
The course focuses on research and analysis designed to formulate policy, programs, and development initiatives to create and maintain economically competitive tourism destinations that are sustainable from an environmental, social, and cultural perspective. Conceptual foundations are applied to real world issues in a planning and policy context.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents) including Tourism Management 309.

Tourism Management 469 3 units; H(3-1T)

Profit and Control in Tourism and Hospitality
Examination of the information systems useful in value-added processes within tourism and hospitality organizations. Interpretive, analytical, and judgmental skills will be applied in the study of quality and environmental costs, JIT and ABC costing, cash management, performance evaluation, and other topics.

Prerequisite(s): Admission to the Haskayne School of Business, and 60 units (10.0 full-course equivalents) including Accounting 217 or 317, and Tourism Management 309.

Antirequisite(s): Credit for Accounting 469 and 361 will not be allowed.

Note: It is recommended that this course be taken before Tourism Management 439.

Tourism Management 479 3 units; H(3-0)

Resort and Recreation Management
Concepts and methods of resort planning, management and marketing, including recreational and event management for the resort environment. Case studies of real and proposed resorts from different environments will be used. Field visits to one or more resorts will be an essential part of the course.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents) including Tourism Management 309.

Tourism Management 499 3 units; H(3-0)

Convention and Events Management
An introduction to the principles and practice of convention and events management, covering meetings, conventions, sports, arts, entertainment, festivals, exhibitions, trade and consumer shows, functions, and their venues. Specific attention is paid to the economic and tourism impacts of events.

Prerequisite(s): Admission to the Haskayne School of Business and 60 units (10.0 full-course equivalents). In addition students must either have completed Tourism Management 309 or be in a Marketing concentration and have completed Marketing 317.

Graduate Courses

Tourism Management 741 3 units; H(3-0)

Policy Planning and Development in Tourism
The planning process. The nature of tourism, and its role in national and regional development. Economic, social, psychological, environmental and technological impacts of tourism on the host community. Trade-offs. Strategies in development. Planning and public policy. National, provincial and local tourism programs. The Alberta example.

Prerequisite(s): Consent of the Haskayne School of Business.

Tourism Management 745 3 units; H(3-0)

International Tourism
The structure, environment and special characteristics of international tourism. Nature, importance and measurement of country/destination image. Host-visitor interaction. Factors motivating, facilitating and constraining international travel. Types of international tourists and their needs. Measurement, forecasting and promotion of international travel. Major issues and elements of planning for international visitors.

Prerequisite(s): Consent of the Haskayne School of Business.

PhD Course

Tourism Management 799 3 units; H(3S-0)

Doctoral Seminars in Tourism
799.01. General Fields in Tourism Management

799.02. Special Fields in Tourism Management

799.03. Tourism Policy and Strategy

799.04. Theory in Tourism

Transportation Studies TRAN

Instruction offered collaboratively by members of the Departments of Economics, Geography, and Political Science in the Faculty of Arts and the Department of Civil Engineering in the Schulich School of Engineering.

Senior Courses

Transportation Studies 301 3 units; H(3-0)
(formerly Transportation Science 301)

Transportation Systems and Analysis
An introduction to sources of data and methods of analysis for describing and analysing transportation systems. Transportation systems will be treated at the municipal, provincial and federal levels and on a modal basis.

Transportation Studies 303 3 units; H(3-0)

Introduction to Transportation Studies
Provides a critical foundation for understanding transportation systems in their modern context, with a particular emphasis on a broad, policy focused exploration. Topics include the role of various transportation modes in Canada's development as a nation, the current status of Canadian transportation modes, and challenges facing the transportation system.

Transportation Studies 473 3 units; H(3-2)
(formerly Transportation Science 473)

Introduction to Transportation Planning
Goals and objectives of urban and regional transportation planning; the transportation planning process; trip generation, trip distribution, modal split, traffic assignment; transportation surveys and data collection; fundamentals of traffic flow; capacity and level of service; urban transportation technology; computer simulation models of urban transportation; environmental impacts; transportation systems management; energy considerations; pedestrian movement systems; urban goods movement; impact of transportation system on city

growth; urban transportation policy and financing in Canada.

Prerequisite(s): Transportation Studies 301 or both Engineering 319 and Civil Engineering 371; or consent of the Instructor.

Transportation Studies 499 3 units; H(5-0)
(formerly Transportation Science 499)

Group Project in Transportation Issues
Students will work in groups to examine real-world transportation problems identified by the instructor. Methodology will be based on knowledge acquired in Transportation Studies 301.

Prerequisite(s): Transportation Studies 301 and consent of the Program.

Transportation Studies 503 3 units; H(3-2)

Decision Support Systems in Transportation Planning
An exploration of the history of decision support in transportation planning from theory to application, including a critical exploration of the 1960's through to modern spatial and aspatial approaches, with an emphasis on critically understanding the decision-support techniques of modern transportation planning. Students will use modern decision-support software tools.

Prerequisite(s): Transportation Studies 303.

Transportation Studies 511 3 units; H(3-0)

Selected Topics in Transportation Economics
Topics may vary from year to year. Provides students with in-depth coverage of transportation issues in a specific sector or region in Canada and relies heavily on microeconomic analysis. Consult the Transportation Studies Program Director for topics available in a given year.

Prerequisite(s): Economics 301, 357 and one of 315 or 395; or consent of the Transportation Studies Director.

MAY BE REPEATED FOR CREDIT

Transportation Studies 513 3 units; H(3-0)

Selected Topics in Transportation Policy
Analysis of government's role in regulating, financing, and managing transportation infrastructure and operations. Comparison of cases in Asia, North America, and Europe will highlight the challenges and opportunities of making transportation more sustainable. Consult the Transportation Studies Program Director for the topics to be explored in a given year.

Prerequisite(s): Political Science 357, and one of 447 or 451 or permission of the Instructor.

MAY BE REPEATED FOR CREDIT

Transportation Studies 599 3 units; H(5-0)
(formerly Transportation Science 599)

Independent Research in Transportation Issues
Individual work on an assigned topic concerning a practical transportation issue under the supervision of a faculty member. The project will normally involve a literature review and the application of theoretical analysis to an actual problem encountered by practitioners. Submission and defence of a midterm progress report and a final report are included.

Prerequisite(s): Consent of Program.

University UNIV

Instruction offered by the University and individual Faculties depending on the topic(s) being covered.

Junior Courses

University 205 3 units; H(3-0)

Learning Beyond High School: Theories and Practices
Theories, research and practice regarding learning and thinking in adult learners. The importance of metacognition, attention, memory, emotions, motivation and attitudes to learning will be discussed. Students will be expected to apply the theory and research to their own learning experiences.

Antirequisite(s): Credit for University UNIV 205 and Educational Psychology 205 will not be allowed.

University 207 3 units; H(3-0)

Exploring Sustainability
A seminar-based survey course which examines principles, practices, obstacles and opportunities pertaining to sustainability. Potential issues to be explored include: Sustainability: Origins, Principles and Practices; Sustainable Development; Planning for Sustainability: The Campus, The City and Beyond; Resource Audits + Sustainability; Corporations and Responsibility; Government and Governance; Climate Change.

Note: This course is intended to be accessible to all students from any Faculty.

Senior Courses

University 301 3 units; H(3S-0)

The Poisoned Pen
Consideration of poisons from two different perspectives, science and literature. Using a problem-based approach, students will not only learn what makes a poison effective but also the essence of good story-telling.

University 401 3 units; H(3-0)

Topic in Interdisciplinary Studies
The focused examination of a topic from a variety of interdisciplinary perspectives.

MAY BE REPEATED FOR CREDIT

University 501 3 units; H(0-4)

Experiential Learning
An application of theory in a community or workplace setting.

Prerequisite(s): Consent of the student's faculty.

Note: Information regarding procedures to be followed in registering for this course is available from Associate Deans (Student Affairs) of undergraduate faculties and the Registrar.

MAY BE REPEATED FOR CREDIT

University 511 3 units; H(3-0)

Special Topics in Sustainability
511.01. Introduction to Sustainable Development

511.02. Theoretical Basis for Interdisciplinary Intervention and Design

University 513 3 units; H(0-8)

Introduction to Interdisciplinary Design Practice

University 515 3 units; H(0-8)

Advanced Interdisciplinary Design Practice
Prerequisite(s): University 511.01.

Graduate Courses

University 601 3 units; H(3-0)

Ethics of Research with Human Subjects
A multidisciplinary course addressing issues in research with human subjects. Topics include theoretical approaches to understanding ethics, respect for persons, benefit and harm, confidentiality and publication, and selection of research subjects. Taught by a multidisciplinary team with very broad experience on research ethics boards.

Prerequisite(s): Consent of the Course Co-ordinator.

University 611 3 units; H(3-0)

Special Topics in Sustainability
611.01. Introduction to Sustainable Development

611.02. Theoretical Basis for Interdisciplinary Intervention and Design

MAY BE REPEATED FOR CREDIT

University 613 3 units; H(0-8)

Introduction to Interdisciplinary Design Practice

University 615 3 units; H(0-8)

Advanced Interdisciplinary Design Practice
Prerequisite(s): University UNIV 611.01.

University Exchange UNEX

Courses administered by the Centre for International Students and Study Abroad.

Junior Course

University Exchange 200 3 units; H(3-0)

Topics in Exchange I
Prerequisite(s): Acceptance into an exchange program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Senior Courses

University Exchange 300 3 units; H(3-0)

Topics in Exchange II
Prerequisite(s): Acceptance into an exchange program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

University Exchange 400 3 units; H(3-0)

Topics in Exchange III
Prerequisite(s): Acceptance into an exchange program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

University Exchange 500 3 units; H(3-0)

Topics in Exchange IV
Prerequisite(s): Acceptance into an exchange program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Urban Studies UBST

Instruction offered by the Department of Geography in the Faculty of Arts.

Junior Course

Urban Studies 253 (Geography 253) **3 units; H(3-0)**

Introduction to Cities
A broad introductory survey, from diverse perspectives, of the processes that shape cities and urban life.

Antirequisite(s): Credit for Urban Studies 253 and 201 will not be allowed.

Senior Courses

Urban Studies 311 **3 units; H(3-0)**

The Gendered City
Introduction to urban gender issues from historical and spatial perspectives. Issues such as the gendering of urban design and planning, daily urban activities, urban labour markets, urban politics, gentrification, suburbanization, and identity construction in urban places are addressed.

Prerequisite(s): Urban Studies 201 or 253.

Urban Studies 313 **3 units; H(3-3)**

The City in Film
Introduction to the representation of cities in film. Theoretical understandings of urban processes are linked to urban experiences as portrayed in urban film. Topics may include changing urban form, suburbanization, economic restructuring, racial conflict, community formation, urban politics, and more. Portions of this course will focus on particular cities around the world.

Prerequisite(s): One of Urban Studies 201, 253, Anthropology 379, Geography 351, Sociology 353.

Urban Studies 394 **3 units; H(3-7)**

Overseas Field School in Sustainable Urbanism Part I
Field research focusing on urban sustainability themes in regions outside North America. Group travel-study combined with formal instruction and seminars.

Prerequisite(s): Consent of the Program Coordinator.

MAY BE REPEATED FOR CREDIT

Urban Studies 395 **3 units; H(3-7)**

Overseas Field School in Sustainable Urbanism Part II
Field research focusing on urban sustainability themes in regions outside North America. Group travel-study combined with formal instruction and seminars.

Prerequisite(s): Consent of the Program Coordinator.

MAY BE REPEATED FOR CREDIT

Urban Studies 451 **3 units; H(3-0)**

Planning in the Canadian City
Introduction to Canadian urban planning theory and practice. Focuses on the history of planning, and aspects of practice such as neighbourhood planning, historic preservation, urban design and long-range planning.

Prerequisite(s): Urban Studies 253 or Geography 253.

Urban Studies 461 **3 units; H(3-0)**

The Transit City
An exploration of the relationships among public transit, urban form, and land use planning and policy in the context of challenges such as climate change, energy shortages, widespread urbanization and traffic congestion.

Prerequisite(s): One of Geography 341, 351, or 451.

Antirequisite(s): Credit for Urban Studies 461 and 505.03 will not be allowed.

Urban Studies 501 **3 units; H(3-0)**

Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): Consent of the Program Coordinator.

Note: Students should contact the Program Coordinator well in advance of the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

Urban Studies 505 **3 units; H(3-0)**

Special Topics in Urban Studies
An examination of selected topics in Urban Studies. See Schedule of Classes for current topic(s).

Prerequisite(s): Fourth Year Standing as an Urban Studies Major or Minor.

MAY BE REPEATED FOR CREDIT

Urban Studies 591 **3 units; H(3-3)**

Capstone in Urban Studies
Capstone course applying the broad interdisciplinary training of the Urban Studies Program to selected problems in urban studies. Collaborative research and analysis is stressed.

Prerequisite(s): 90 units (15.0 full-course equivalents) and admission to the Urban Studies Major or Minor.

Veterinary Medicine VETM

Instruction and services offered by the Faculty of Veterinary Medicine.

First Year Curriculum

All courses are compulsory.

Veterinary Medicine 300 **(3-0)(3 credits)**

Clinical Presentations I
Integrated clinical presentations applied to a range of problems faced in veterinary medicine with individual, groups, and populations of animals. Students develop analytic and non-analytic diagnostic reasoning skills including differentiating normal from abnormal, correlating clinical signs with organ systems, generating problem lists, and using foundational knowledge from discipline courses to help understand clinical presentations. Related public health and disease prevention issues are explored.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 305 **(0-6)(5 credits)**

Clinical Skills I
A series of clinically oriented learning experiences aimed to develop competence in individual and herd physical examinations and history taking. Students develop introductory skill sets in clinical intervention, patient management, and disease prevention. Experience is gained in diagnostic procedures.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 307 **(1.5-1.5)(3 credits)**

Professional Skills I
Learning the role of professionalism and research in veterinary medicine. Students formulate the basis of professionalism competencies including: communication, ethics, stewardship, clinical reasoning, self-management, emotions, values and reflection in daily practice, and for the community being served. Key research concepts including hypothesis generation, qualitative and quantitative methods, data search skills, and critical appraisals of the literature are addressed.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 320 **(1-4)(5 credits)**

Anatomy and Histology
Hands-on dissection of organ systems in representative mammals prepares students for clinical coursework. Dissections are supplemented with pro-sections, palpation of live animals, radiographs, CT, MRI, and ultrasound imagery. Clinically relevant structures and the three-dimensional relationships of organs are emphasized. Functional anatomy at each level of organization is integrated with coursework in physiology and pathology.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 321 **(3-0)(3.5 credits)**

Physiology
Fundamental and comparative physiological concepts for each body system. Physiological concepts are reinforced through clinical examination of companion and farmed animals. Emphasis placed upon formulating how, and why, a disturbance affecting one particular body system manifests in a particular way.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 322 **(3-0)(1.5 credits)**

Behaviour
Fundamental concepts pertaining to the behaviour of animals. The effect of husbandry practices on the welfare and behaviour of companion and farmed animals is examined. Wildlife behaviour, particularly at the interface with human activities, is also addressed. Emphasis placed on clinical recognition of normal behaviour of companion and farmed animals. Pertinent legislations regarding the welfare of companion and farmed animals are discussed.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 323 **(3-0)(1.5 credits)**

Animals, Health, and Society
Role of veterinarians in promoting animal, human and ecosystem health. Emphasis on the determinants of health and the interaction of animals, environmental and social factors that influence health. The contributions of veterinarians to human, ecosystem and animal health at local, provincial, national and international levels are reviewed. Demonstrates how laws, policies and management decisions are applied to foster healthy animals, ecosystems and human-animal interactions.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 324 (3-0)(1 credit)

Genetics and Molecular Biology
Fundamental concepts of genetics and molecular biology explored in the context of cellular biology and animal health. Applications of molecular biology tools in veterinary medicine are addressed. Relevant examples from veterinary medicine are used to explain foundation principles.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 342 (3-0)(1.5 credits)

Pathologic Basis of Disease
Introduction to the study of the morphologic and functional changes that occur in cells, tissues and organs as a result of disease. Students are introduced to safe, systematic, species-specific approaches to performing post-mortem examinations and learn to recognize and describe common gross and microscopic lesions using appropriate medical terminology. Emphasis is placed on the understanding of basic disease mechanisms and the complex relationship between host, pathogen and environment in the onset of disease. The use of pathology as a diagnostic tool, and the relationship between the understanding of basic pathologic processes and the practice of high quality clinical medicine are discussed.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 343 (3-0)(1.5 credits)

Immunology
Interactive learning activities illustrate the components of the immune system. Specific functions of the immune system are discussed with respect to age, species and impairment. Mechanisms involving immunological functions and potentially leading to disease are outlined and allocated to clinical and sub-clinical pictures. Various vaccines, as well as their preparation, composition, use and limitations will be presented. The induction of immunity including laboratory testing for immune responses is demonstrated.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 344 (3-0)(0.75 credits)

Principles of Epidemiology
Introduction to the basic principles and methods used in veterinary epidemiology. Concepts include types of epidemiologic studies, measures of disease frequency and association, epidemic and infectious disease dynamics, disease causation, and the relationships between population and individual animal medicine. The course provides foundational skills relevant to population science, which includes public health, health management and clinical medicine.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 345 (3-0)(0.75 credits)

Introduction to Nutrition
Fundamental concepts pertaining to function, metabolism, requirements, and sources of nutrients and energy for companion and production animals. Feeds and ingredients used in animal diets will also be examined.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 360 (54 hours)(2 credits)

Introduction to Veterinary Medicine
Using a variety of field experiences, students explore how people associate with the animal world, the issues that arise from these associations, and the potential roles that veterinarians can play in these contexts. Students work in teams to investigate examples of animals as companions, animals in production, animals in sport, animals as alternative livestock, animals used for food, and animals in research. Students gain a better understanding of the structure and function of the dairy, beef, swine, and sheep industries and the multiple roles that veterinarians occupy within those industries.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

NOT INCLUDED IN GPA

Second Year Curriculum

All courses are compulsory.

Veterinary Medicine 400 (3-0)(3 credits)

Clinical Presentations II
A clinical presentations format applied to a range of problems faced in veterinary medicine to help students to continue development of their analytic and non-analytic diagnostic reasoning skills. These skills include developing schemata and differential diagnoses lists, making decisions about using appropriate diagnostic test, interpreting and integrating data from those tests, and using foundational knowledge from discipline courses to diagnose common clinical presentations. Students also explore a broad range of animal health issues related to the presentations.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 405 (0-6)(5 credits)

Clinical Skills II
Practical orientated laboratories designed to provide the opportunity for the development of skills in basic surgical principles, clinical examination of relevant body systems and in both clinical and anatomic pathology. Students also gain hands-on experience in practical clinical intervention, case management, and disease prevention.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 407 (1.5-1.5)(3 credits)

Professional Skills II
Professional skills competencies and knowledge are enhanced with an added focus on relationship centred practice including communication, coaching and feedback. The explanation and planning phase of professional consultations as well as skills inherent to providing structure are addressed. The concept of the healthy veterinarian is expanded to include professional renewal and self-care, pursuing and meeting professional goals, focusing career and growing and developing in a changing environment. Legal issues including informed consent, records management, malpractice and public safety obligations are included.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 410 (1.5-0)(0.75 credits)

Basic Surgical Principles
A comprehensive introduction to the foundational principles of general veterinary surgery across species. It will provide DVM students with a foundation in the basic principles of both soft tissue and orthopedic surgery that can then be used to develop their hands-on surgical skills and as the foundation for more species-specific courses.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 420 (3-0)(1.5 credits)

Health Management
Further epidemiological concepts useful for the practice of veterinary medicine. These concepts include appropriate use and choice of diagnostic tests in individual animal and population settings, developing a structured approach towards investigating disease outbreaks, exploring alternative strategies for treating and controlling disease, and evaluating whether treatment strategies are effective. Evaluation of the scientific literature is a component of the course.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 421 (3-0)(2.25 credits)

Systemic Pathology
Using a systematic and species-specific approach, common developmental, traumatic, degenerative, vascular, toxic, infectious, neoplastic and miscellaneous conditions are reviewed. Based on the species affected, students identify and describe common gross and microscopic lesions and formulate a morphologic diagnosis or list of rule outs. Disease pathogenesis, tissue sampling, sample submission, and the value of ancillary diagnostic testing are emphasized. Students model interpreting and communicating post-mortem findings and the results of ancillary tests to clients and colleagues.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 422 (3-0)(1.5 credits)

Virology
Fundamental knowledge on the nature of viruses and prions are imparted through clinical, cellular and molecular analysis of important diseases of animals and - if inter-transmissible - humans. Students learn to develop diagnostic plans and understand principles of laboratory diagnostic testing. General and specific intervention measures for viral and prion infections and diseases are explained and their implementation practiced. The course utilizes a combination of classical teaching, scenario-driven problem solving and exposure to clinical cases and laboratory testing.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 423 (3-0)(1.5 credits)

Bacteriology
Introduction to fundamental principles of general bacteriology, and bacterial diseases of domestic animals. Provides an understanding of how bacteria interact with the environment and the animal host. Students learn how different bacterial virulence mechanisms lead to the spectrum of animal bacterial diseases. Students become familiar with the actions that lead to diagnosis of bacterial infections, and how to match appropriate preventive and control measures with different pathogens

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 424 (3-0)(1.5 credits)

Parasitology
Introduction to fundamental principles of parasitism in domestic and wild animals. Emphasis is placed on understanding the epidemiology and host-parasite interactions of parasites of clinical, trade, and zoonotic importance in North America. Students become familiar with the principles and application of classical and molecular diagnostic techniques. Using a series of case studies, students apply this knowledge to formulate preven-

tion and treatment plans for parasites of major importance.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 440 (3-0)(1.5 credits)

Public Health and Risk Analysis
The role of animals as sources of public health hazards and as sentinels for environmental health risk factors is examined. Students apply systems thinking to identify how zoonotic diseases and food safety hazards emerge, spread and can be controlled. Public health methods and tools related to veterinary issues are applied to identify options and methods for the prevention and control of hazards and reduction of health risks.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 442 (3-0)(1.5 credits)

Clinical Pathology
Students develop a systematic approach to the evaluation of routine clinical pathology tests (hematology, biochemistry, urinalysis, cytology, and endocrinology) that leads to correct interpretation, aided by an understanding of the significance of common changes and underlying physiological principles. Integration of laboratory results with the patient's clinical presentation is emphasized. Correct interpretation of routine lab tests and communication of results to clients, colleagues, and experts is covered, as is appropriate integration of lab tests into decision-making in daily practice. Students also gain experience with basic in-house lab tests and microscopy.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 443 (3-0)(1.5 credits)

Clinical Pharmacology and Toxicology
Provides students with the understanding and tools required to use drugs effectively and safely in veterinary medicine. Basic principles of pharmacology and clinical pharmacology for the major drug classes are addressed. Principles of pharmacokinetics and metabolism as they apply to the clinical use of drugs are discussed. Basic principles of clinical toxicology that apply to the prevention, diagnosis, and treatment of common and regionally relevant poisonings and adverse drug reactions are covered.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 444 (3-0)(0.75 credits)

Diagnostic Imaging
Introduction to the basic principles and uses of common diagnostic imaging modalities through the use of lectures, group discussions, and clinical presentations. The theoretical basis behind each imaging technology, the acquisition of quality images, and the ability to interpret and describe normal and abnormal findings are emphasized. Instruction is included in the necessary control measures for working safely with diagnostic imaging equipment.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 450 (3-0)(0.75 credits)

Selected Topics in Areas of Emphasis I
Students select from the Faculty's four major areas of emphasis, which are production animal health, equine health, ecosystem and public health, and investigative medicine.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 451 (3-0)(0.75 credits)

Selected Topics in Areas of Emphasis II
Students select from the Faculty's four major areas of emphasis, which are production animal health, equine health, ecosystem and public health, and investigative medicine.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Note: The same subject matter as taken in Veterinary Medicine 450 cannot be taken in Veterinary Medicine 451.

Veterinary Medicine 460 (3-0)(1.0 credits)

Applied Nutrition
Core concepts pertaining to nutritional requirements, feeding regimes, and nutritional disorders in cattle (beef and dairy), poultry, swine, horses, and companion animals. Feeding management of exotic animals is also discussed. Emphasis is placed on practical application of nutritional concepts in companion and farmed animals.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 461 (27 hours)(0.75 credits)

Outbreak Investigation
Investigating a series of simulated outbreaks, applying steps to determine whether an outbreak exists, establishing a case definition, describing the epidemiology of the disease, generating and testing hypotheses, and communicating their findings to appropriate parties.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

NOT INCLUDED IN GPA

Veterinary Medicine 462 (27 hours)(0.75 credits)

Foreign Animal Disease
A week-long field experience designed and delivered by a team of faculty and public practice veterinarians. Students work through a simulation of an incursion of foreign animal disease into Canada. The simulation gives students experience working with disease surveillance, case identification, emergency preparedness, and the role of public practice veterinarians in maintaining the safety of Canadian livestock.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 463 (27 hours)(0.75 credits)

Field Experiences in Areas of Emphasis
Students select a field experience in one of the Faculty's four major areas of emphasis which are production animal health, equine health, ecosystem and public health, and investigative medicine.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Third Year Curriculum

All courses are compulsory.

Veterinary Medicine 500 (3-0)(3 credits)

Clinical Presentations III
Covering a range of problems in veterinary medicine. Continued development of diagnostic reasoning skills and problem management are emphasized. Students synthesize comprehensive treatment plans that take into account therapeutic approaches, outcomes, feasibility, economics, client expectations, compliance, public health, regulations, and the environment.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 505 (0-6)(5 credits)

Clinical Skills III
Through hands-on scheduled practical and surgical laboratories students gain experience in relevant body system clinical evaluations and in routine anaesthesia and surgery. In addition, students have the opportunity to further develop and refine their diagnostic skills sets.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 507 (1.5-1.5)(3 credits)

Professional Skills III
Develop professional skills necessary for dealing with challenging issues in veterinary medicine including death and dying, welfare, ethical dilemmas, conflict and handling medical errors. Communication domains including wildlife, government, production animal, public health, rural and Northern practice and risk communication. The integration of process skills and content are fully explored and expanded for the purpose of case management communication. Additional emphasis is placed on business structures, organization, economics and finance.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 520 (3-0)(2.25 credits)

Advanced Health Management
Provides an overview of diagnosing, managing, and preventing the common disorders that occur at a population level and usually affect the productivity of the group. Emphasis is placed upon application of evidence-based medicine to making a herd diagnosis and managing the problem by treatment, control, and prevention. Health programs that operate in dairy cattle herds, sheep flocks, pig herds, and poultry flocks are explored. Health management principles for pet shelters and other species are also explored.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 521 (3-0)(2.50 credits)

Equine Medicine and Surgery
Prepares the student for general equine practice by providing the foundational knowledge needed for diagnosing and treating the most common equine diseases using medical or surgical approaches. Emphasizes the importance of professional and ethical conduct in the context of equine practice and promotes life-long continuing education.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 522 (3-0)(2.50 credits)

Small Animal Medicine and Surgery
Prepares students for small animal practice by providing the foundational knowledge needed for diagnosing and treating the most common diseases encountered in small animal and small exotic species using medical or surgical approaches. Promotes practices that are in compliance with animal welfare and ethical professional conduct.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 523 (3-0)(1.5 credits)

Anaesthesiology and Therapeutics
Introduction to the principals and practice of veterinary anaesthesiology in commonly encountered large, small, and exotic animal species, and the practical application of clinical pharmacology (therapeutics). Focus on local and general anaesthesia for low risk animals, with an overall goal of

reducing the risk of mortality. Students' knowledge of analgesia and basic critical care is enhanced. The therapeutics portion of the course focuses on therapeutic decisions, drug selection, and drug delivery.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 530 (3-0)(0.75 credits)

Selected Topics in Veterinary Medicine I
Topics will vary from year to year, and will be announced in advance.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 531 (3-0)(0.75 credits)

Selected Topics in Veterinary Medicine II
Topics will vary from year to year, and will be announced in advance.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 540 (3-0)(2.00 credits)

Food Animal Medicine and Surgery
Prepares students for general food animal practice by providing the foundational knowledge needed for diagnosing and treating the most common diseases encountered in food animal species and large exotic species using medical or surgical approaches. Also promotes practices that are in compliance with animal welfare and ethical professional conduct.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 541 (3-0)(1.5 credits)

Theriogenology
Provides the basis of knowledge and skills to develop clinical competence in managing the reproductive health of economically important livestock species and companion animals. Students integrate knowledge from various disciplines to diagnose and manage clinical issues pertaining to the reproductive health of animals on an individual-animal or herd basis. The economic implications of reproductive efficiency in various livestock species are analyzed.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 542 (3-0)(0.75 credits)

Emergency and Critical Care
Introduction to the basic principles of emergency and critical care medicine. Through a combination of lectures, simulated case work-ups and assignments, students acquire the knowledge needed to attend to emergency situations, and become familiar with the steps needed to prepare oneself ahead of time for such situations.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 550 (3-0)(0.75 credits)

Selected Topics in Veterinary Medicine III
Topics will vary from year to year, and will be announced in advance.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 551 (3-0)(0.75 credits)

Selected Topics in Veterinary Medicine IV
Topics will vary from year to year, and will be announced in advance.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 561 (27 hours)(1 credit)

Ecosystem and Public Health Field Course
Provides students the opportunity to synthesize concepts of Veterinary Medicine 323 and 440. Methods to apply integrated approaches in detecting, assessing and managing animal, human and ecosystem health relevant to sustaining populations, communities and systems are included. Students gain experience in risk assessment, surveillance, epidemiology, and participatory practice through work on case studies.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Fourth Year Curriculum

All students are required to take Veterinary Medicine 570, 580 and 590. Students also take one of Veterinary Medicine 582, 583, 584 or 585.

Veterinary Medicine 570 (4 weeks)(4 credits)

Laboratory Diagnostics
A foundation course necessary for entering general veterinary practice. This is a required course in which students must successfully complete rotations in laboratory diagnostics and diagnostic imaging at laboratories at the Clinical Skills Building on the Spy Hill campus.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 580 (16 weeks)(16 credits)

General Veterinary Practice
A foundation course important for entering general veterinary practice. This is a required course in which students must successfully complete clinical rotations in general veterinary practice at sites located within the Distributed Veterinary Teaching Hospital.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 582 (10 weeks)(10 credits)

Production Animal Health
Students choose from a variety of rotations that enable concentration within Production Animal Health.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 583 (10 weeks)(10 credits)

Ecosystem and Public Health
Students choose from a variety of rotations that enable concentration within Ecosystem and Public Health.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 584 (10 weeks)(10 credits)

Equine Health
Students choose from a variety of rotations that enable concentration within Equine Health.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 585 (10 weeks)(10 credits)

Investigative Medicine
Students choose from a variety of rotations that enable concentration within Investigative Medicine.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Veterinary Medicine 590 (10 weeks)(10 credits)

Clinical Enrichment
Students choose elective rotations from a range of practicum experiences in veterinary medicine in order to expand or deepen their knowledge and skills.

Prerequisite(s): Admission to the Doctor of Veterinary Medicine (DVM) Program.

Graduate Courses

The following courses are delivered through the Veterinary Medical Sciences Graduate Program. Enrolment in these courses is not open to DVM students. Please consult the Graduate Studies calendar for additional details and requirements for students in other graduate programs.

Veterinary Medicine 601 3 units; H(3-0)

Professional Skills in Health Science Research
Includes a series of workshops focusing on skills essential for success in health science research. Topics include: Research Integrity; Ethics; Grants and Grant Writing; Verbal and Written Communication of Research Findings; Career Development; and Career Options in the Health Sciences.

Prerequisite(s): Consent of the Faculty.

NOT INCLUDED IN GPA

Veterinary Medicine 603 (Biology 603) 3 units; H(3-1)

Biology of Laboratory Animals
Based on the Canadian Council on Animal Care Syllabus "Basic Principles of Laboratory Animal Science for Research Scientists." In addition to the study of common, research, farm and exotic animals, topics to be covered include ethical considerations, regulation and legislation, animal models, animal facilities and husbandry, hazard control, surgery, anaesthesiology, euthanasia and post-mortem examinations. Practical sessions will provide experience in handling and restraint of specific laboratory animals, injections, blood collection, anaesthesiology and surgery.

Note: Enrolment in this course is restricted in the first instance to graduate students who will do research utilizing animals.

Veterinary Medicine 605 (Community Health Sciences 605) 3 units; H(3-1T)

Introduction to Biostatistical Methods
An introductory course on how to analyze and design research related to biological sciences. Emphasis is placed upon formulating good research questions, evaluating the appropriateness of different statistical methods for analyzing results, and performing and interpreting such statistical analyses. Statistical analyses will be carried out using modern statistical software.

Prerequisite(s): Consent of the Faculty.

Veterinary Medicine 690 3 units; H(3-0)

Directed Study
Lectures, seminars, term papers and/or other training directed to one or only a few students in theoretical and/or laboratory methods at the advanced level in veterinary medical sciences. These courses are offered when no other suitable alternatives are available.

Prerequisite(s): Consent of the Faculty.

Note: An approval form may be obtained from the Office of Research and Graduate Education, and must be signed by the VMS Graduate Program Director before a student can register.

MAY BE REPEATED FOR CREDIT

Veterinary Medicine 701 **3 units; H(3-0)**

Advanced Topics in Reproductive Health
A series of topics, ranging from basic sciences to clinical topics (including ethical issues) to increase awareness and comprehension regarding current issues in reproductive health.

Prerequisite(s): Research interest in reproductive health/reproductive biology. Consent of course co-ordinator and student's supervisor, if applicable.

Veterinary Medicine 702 **3 units; H(3-0)**

Advanced Topics in Stem Cell Biology and Regenerative Medicine
Provides a comprehensive overview of stem cell biology in the context of embryonic development and adult tissue maintenance. Students will gain an appreciation for embryonic versus adult stem cells and how these pluripotent or multipotent cells may be utilized in regenerative medicine (i.e. treatment of congenital defects, diseases or injury).

Prerequisite(s): Students not enrolled in the VMS graduate program will require consent of the instructor.

Veterinary Medicine 721 **3 units; H(3-0)**

Wildlife Parasitology: Principles and Techniques
Students will learn about the ecology of parasites in wildlife populations with emphasis on impacts of parasitism, invasive species, and conservation issues. This is taught through a series of seminars, critical evaluation and discussion of the literature, and independent and group projects. Laboratory sessions include on parasitology techniques for surveillance and research.

Prerequisite(s): Consent of the instructor.

Note: This course may not be offered every year. Please contact vmgrad@ucalgary.ca for information.

Women's Studies WMST

Instruction offered by the Faculty of Arts. Please contact the Arts Students' Centre for specific details.

Junior Course

Women's Studies 201 **3 units; H(3-0)**

Introduction to Women's Studies
An examination of the historical, geographical and political origins of feminism and women's studies, with particular emphasis on Canada in a global context.

Senior Courses

Women's Studies 301 **3 units; H(3-0)**

Topics in Women's Studies
Offers the opportunity to explore a topic of particular interest to Women's Studies scholars.

301.01. Global Feminisms

301.02. Gender Subjectivities

301.03. Social Issues and Gender

301.04. Women and Health

301.05. Gender and Popular Culture

Women's Studies 311 **3 units; H(3-0)**

Feminist Theorizing
Feminist theories help us understand why things are the way they are, and suggest useful strategies for appropriate social change. This course will critically consider contemporary approaches to feminist theorizing and their historical bases.

Women's Studies 315 **3 units; H(3-0)**

Feminist Methods
Explores the scholarly and political implications of conducting feminist research by examining key methods and their justifications.

Women's Studies 401 **3 units; H(3-0)**

Special Topics in Women's Studies
An in-depth exploration of a specific area of research interest in women's studies.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Women's Studies.

MAY BE REPEATED FOR CREDIT

Women's Studies 405 **3 units; H(3S-0)**

Seminar in Feminist Praxis
An opportunity to engage in feminist activism, reflect on these experiences and critically situate them within the history and perspectives of Western feminist activism. Activist/volunteer work, outside of class-time, will be required.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Women's Studies.

Women's Studies 501 **3 units; H(3-0)**

Independent Research in Selected Topics
Supervised individual study of a special topic.

Prerequisite(s): 3 units (0.5 full-course equivalent) in courses labelled Women's Studies and consent of the Program Co-ordinator.

Note: Students should contact the Program Co-ordinator well in advance of the first day of classes to arrange an independent studies course.

MAY BE REPEATED FOR CREDIT

Women's Studies 590 **6 units; F(3-0)**

Honours Thesis
Supervised individual research and preparation of an Honours thesis.

Prerequisite(s): Admission to the Honours program in Women's Studies.

Zoology ZOOL

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.

†Limited amounts of non-scheduled class time involvement will be required for these courses.

Junior Course

Zoology 269 **3 units; H(3-2T)**

Introduction to Human Anatomy and Physiology
The structure and function of human organ systems with emphasis on homeostasis.

Prerequisite(s): Biology 30.

Antirequisite(s): Credit for Zoology 269 and any of Biology 305, Medical Science 404, 604, Zoology 461, 463, Kinesiology 259, 260 or 323 will not be allowed.

Note: Open only to students enrolled in the UC-Qatar Nursing program.

Senior Courses

†Zoology 375 **3 units; H(3-3)**

An Introduction to Invertebrate Zoology
A survey of the invertebrate phyla with particular reference to those which exemplify the following grades of organization: protoplasmic, cellular, tissue, and organ-system and within the latter - acoelomate, pseudocoelomate, schizocoelomate and enterocoelomate. Emphasis is placed on functional morphology of the major phyla.

Prerequisite(s): Biology 371 or 233 or any two of Biology 231, 241, and 243 and 57 units (9.5 full-course equivalents).

Zoology 379 **3 units; H(3-3)**

An Introduction to Vertebrate Zoology
Systematics, natural history and biology of vertebrates, including fishes, amphibians, reptiles, birds and mammals. Laboratory work will emphasize the identification and morphology of native taxa as well as basic techniques of biological systematics.

Prerequisite(s): Biology 371.

Antirequisite(s): Credit for Zoology 379 and either Zoology 477.01 or 477.02 will not be allowed.

Zoology 435 **3 units; H(3-3)**

Entomology
Introduction to the insects. Structure and function, evolution, patterns of diversity; insect-environment interactions; interactions with plants and other animals, including humans; insect behaviour, particularly social behaviour; cultural and forensic entomology.

Prerequisite(s): Biology 313 and one of Biology 371 or Zoology 375.

Note: Offered during odd-even dated academic years.

Zoology 461 **3 units; H(3-3/2)**

Animal Physiology I
Study of control mechanisms in nerves, sensory organs, muscles and endocrine glands.

Prerequisite(s): Biology 331 or Neuroscience 301.

Antirequisite(s): Credit for Zoology 461 and any of Biology 305, Medical Science 404, 604, Zoology 269, Kinesiology 259, 260 or 323 will not be allowed.

Note: Prior completion of Physics 211 or 221; and 223; and Biochemistry 341, 393 or Chemistry 351 is strongly recommended. Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Zoology 463 **3 units; H(3-3/2)**

Animal Physiology II
Study of body fluids and hemostasis, body defence systems, reproductive physiology, respiration, circulation, excretion, gastrointestinal physiology and thermoregulation.

Prerequisite(s): Zoology 461.

Antirequisite(s): Credit for Zoology 463 and any of Biology 305, Medical Science 404, 604, Zoology 269, Kinesiology 259, 260 or 323 will not be allowed.

Note: Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Zoology 475 **3 units; H(3-3)**

The Invertebrates
The phylogeny of the invertebrates; the relationships and adaptive radiation of all animal phyla, with emphasis on those structural and functional characteristics that are of evolutionary significance.

Prerequisite(s): Zoology 375.

Zoology 483 **3 units; H(3-3)**

Principles in Parasitism
An introduction to protozoan, helminth, and arthropod parasites of animals; principles of host and parasite adaptations, host defence, disease and epidemiology. A series of web-based laboratory

exercises emphasizes morphology, life cycles and systematics of parasites. This course is delivered via video-broadcasting facilities.

Prerequisite(s): Cellular, Molecular and Microbial Biology 343 or Zoology 375.

Zoology 507 **3 units; H(0-8) or H(3-0)**

Special Problems in Zoology
Independent research, lectures, seminars, term papers and training in theoretical and/or laboratory methods.

Prerequisite(s): 54 units (9.0 full-course equivalents) and consent of the Department.

Note: Consult the departmental website for registration information.

MAY BE REPEATED FOR CREDIT

Zoology 515 **3 units; H(3-3)**

Comparative Vertebrate Anatomy
The structural, functional, developmental and evolutionary relationships of the organs and systems of the vertebrates. Laboratory work will emphasize the dissection, identification and homologies of structures in various vertebrates.

Prerequisite(s): Zoology 379.

Antirequisite(s): Credit for Zoology 515 and 377 will not be allowed.

Note: Offered in even-odd academic years

Zoology 528 **6 units; F(0-8)**

Independent Studies in Zoology
Original and independent thought, practical research and the completion of written and oral reports.

Prerequisite(s): Biology 315, 90 units (15.0 full-course equivalents) and consent of the Department.

Note: Consult the departmental website for registration information.

MAY BE REPEATED FOR CREDIT

Zoology 530 **6 units; F(0-8)**

Honours Research Project in Zoology
Research project under the direction of one or more faculty members in the Department of Biological Sciences. Formal written and oral reports must be presented on completion of this course. Open only to Honours Zoology students or Honours Biological Sciences students.

Prerequisite(s): Biology 315, 90 units (15.0 full-course equivalents) and consent of the Department.

Note: Consult the departmental website for registration information.

Zoology 567 **3 units; H(3-0)**

Animal Behaviour
Offered from an evolutionary and ecological perspective. Development of ethological ideas; interaction of genotype and environment in ontogeny of behaviour; role of behaviour in dealing with environmental challenges.

Prerequisite(s): Biology 313 and one of Biology 371, Ecology 429, Zoology 375, 377 or 477.

Antirequisite(s): Credit for Zoology 567 and Marine Science 546 will not be allowed.

Note: Offered during odd-even dated academic years. Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Zoology 571 **3 units; H(3-2)**

Palaeobiology of Vertebrates
Evolutionary trends in the major groups of vertebrates from both neontological and palaeontological viewpoints. The interpretation of palaeontological data and their applicability to our understanding of evolution, systematics and palaeoecology.

Prerequisite(s): Zoology 377 or 379.

Antirequisite(s): Credit for Zoology 571 and either Zoology 571.01 or 571.02 will not be allowed.

Note: Prior completion of Geology 201 or 209 is strongly recommended. Offered in odd-even academic years.

Zoology 575 **3 units; H(3-0)**

Advanced Topics in Animal Biology
Prerequisite(s): Biology 313.

MAY BE REPEATED FOR CREDIT

†Zoology 577 **3 units; H(3-3)**

Mammalogy
A detailed examination of the evolution, morphology, physiology, ecology and behaviour of mammals.

Prerequisite(s): Biology 313 and one of Zoology 379 or 477.01.

Note: Offered during even-odd dated academic years. Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.

Zoology 583 **3 units; H(3-0)**

Ornithology
An overview of the biology of birds, including their evolution, morphology, ecology and behaviour. The course will emphasize the influence that being a flying homeotherm has had on almost every aspect of avian biology.

Prerequisite(s): Biology 313 and one of Zoology 379 or 477.01.

Note: Offered during odd-even dated academic years.

Zoology 595 **3 units; H(3-0)**

Comparative Neuromuscular Physiology
Examination of the nervous and muscular systems of selected invertebrate animals spanning phyla from the Protozoa to the Echinodermata. Material will be selected that relates the behaviour to the nervous and muscular systems unique to each group. Specializations unique to various groups will be examined as well as the increasing complexity at various levels of organization. Instructional format includes lectures and student seminars.

Prerequisite(s): Zoology 461.

Antirequisite(s): Credit for Zoology 595 and Neuroscience 541 will not be allowed.

Zoology 597 **3 units; H(3-0)**

Principles of Endocrinology
General and molecular aspects of endocrine physiology. Topics will include the mechanisms of hormone action (receptor occupancy and transduction of signal), current techniques in endocrinology, synthesis and release of hormones, and the functional role of different endocrine organs. Lectures will include examples from lower vertebrates and invertebrates to emphasize comparative aspects.

Prerequisite(s): Zoology 463.

Graduate Course

Zoology 697 **3 units; H(3-1T)**

Advanced Topics in Comparative Endocrinology
The principles of endocrinology will be provided through the lecture component of Zoology 597, and this will be augmented with additional reading, term papers and seminars in comparative endocrinology.

Prerequisite(s): Zoology 463.

Antirequisite(s): Credit for Zoology 697 and 597 will not be allowed.

About the University of Calgary

The University of Calgary is a co-educational, non-denominational government supported institution possessing the right of conferring degrees, other than degrees in Divinity, within the Province of Alberta. It is a member of the Association of Commonwealth Universities and of Universities Canada.

The University of Calgary is Canada's leading next-generation university – a living, growing and youthful institution that embraces change and opportunity with a can-do attitude. Located in the nation's most enterprising city, the University is making tremendous progress on our journey to become one of Canada's top five research institutions, grounded in innovative learning and teaching and fully integrated with the community of Calgary.

As a comprehensive academic and research institution, the University of Calgary inspires and supports discovery, creativity and innovation across all disciplines. Through the Taylor Institute for Teaching and Learning, opening in Spring 2016, the University will take the lead in educational innovation by researching the most effective methods for engaging students, by supporting faculty to be the best teachers they can be and by providing some of the most innovative learning spaces available anywhere in North America.

The University of Calgary attracts and nurtures the talent that drives new knowledge creation, improves lives and betters our world. In this rich learning environment, the University serves over 31,000 students in more than 200 undergraduate, graduate and professional degree programs, and provides the community with diverse lifelong learning opportunities. International study, volunteer, work, and research programs provide global context while promoting diversity and excellence in learning, teaching and research.

The University of Calgary stands out among Canadian universities in how it actively engages students in leadership development in all areas – the arts, athletics, science, medicine, engineering, volunteerism and business. It is also a leader in sustainability with its set of values embraced by the campus through teaching, leadership and campus operations.

Research and Education

As a member of the U15 leading research-intensive universities in Canada, the University of Calgary is ranked one of the Top 10 research universities in the country. As a comprehensive research institution, the University houses 73 Canada Research Chairs and more than 50 research institutes and centres working to find solutions to some of the most challenging problems facing society today. It has over 1,800 academic staff actively engaged in research, scholarship and teaching in Canada and around the world.

Innovation, discovery and learning are at the heart of all that we do. Our relentless pursuit of quality in our teaching and research programs is guided by our mission to contribute to the well-being of the people of Alberta, Canada and the world. Research brings significant benefits provincially, nationally and internationally, and is the foundation of Alberta's economic and social vitality. Interdisciplinary research is core to the University's teaching and research mandate.

The University offers a high quality undergraduate education that is characterized by the synthesis of research, teaching and learning. We mean to enhance the undergraduate learners' experience by using a student-centred focus that maximizes opportunities to provide a distinctive learning experience that fully integrates the features of a research university. The University is broadening opportunities for students to take inquiry-based courses that lead to greater critical thinking skills, increased exposure to undergraduate research and greater access to leading edge scholars. International study, volunteer, work, and research programs give graduates global context while promoting diversity and innovation in teaching and research.

Students at the University of Calgary are officially recognized for their involvement in campus activities outside of the classroom. The co-curricular record is an initiative that encourages and fosters a campus culture of volunteerism and community involvement amongst its students.

The University of Calgary stands out among Canadian universities in how it actively engages students in leadership development in all areas – the arts, athletics, science, medicine, engineering, volunteerism and business. It is also a leader in sustainability – living a set of values embraced by the campus through teaching, leadership, and campus operations.

Our efforts are to raise our global profile, enhance the quality of our undergraduate and graduate programs, promote innovation and excellence in scholarly activity and provide significant returns and tangible benefits to our community and economy.

Facilities

The MacEwan Student Centre is a hub of activity at the University. There is also a museum and art gallery, four performance theatres, two childcare centres and residences for single students and students with families. The University is currently expanding the Engineering Complex, establishing the Taylor Institute for Teaching and Learning, and creating new residences.

The Cumming School of Medicine and the Faculty of Veterinary Medicine are located on the south campus adjacent to the Foothills Hospital. Satellite institutes of the University include, the Kananaskis Biogeoscience Institute, located a short drive from the city on the eastern slopes of the Rocky Mountains, the Rothney Astrophysical Observatory, located in the foothills south of the city and a campus in Doha, Qatar, offering internationally accredited nursing degrees to students in the Middle East. Development of the University's west campus is currently taking place, and is the site of the new Alberta Children's Hospital.

The University of Calgary features some of the finest athletic facilities in the country, The Olympic Oval is an international speedskating facility and houses the Canadian Sport Institute, a high-performance training centre and two Olympic-sized rinks where the reigning women's gold medal hockey team trains. There are also tennis courts, a triple gymnasium, a yoga studio, an Olympic-size swimming pool, weight rooms, jogging tracks, an Outdoor Centre offering equipment rentals, courses and instruction, and a huge indoor climbing wall. Nearby is the home of the Dinos football team, McMahon Stadium.

Governance

The University of Calgary has two governing bodies:

- The Board of Governors is the corporate body charged with the management and control of the University, its property, revenue, business and affairs.
- The General Faculties Council (GFC) is responsible for the academic affairs of the University, subject to the authority of the Board of Governors.

Each Faculty has a Faculty Council empowered to determine the Faculty's programs of

study, conduct examinations, provide for the admission of students, determine conditions for withdrawal, and to authorize the granting of degrees, subject to conditions imposed by the General Faculties Council.

The Students' Union and the Graduate Students' Association provide for the administration of the affairs of students and the promotion of their general welfare.

More information can be found at: ucalgary.ca/secretariat.

Logo/Coat of Arms

The University of Calgary combines the best of long-established university traditions with Calgary's frontier spirit of originality and innovation.

Our logo was designed to reflect bold thinking and a connection with the origins of Calgary. The logo has two components: the crest and the wordmark. The crest represents and respects our historical heraldry while the more contemporary wordmark reflects our focus on the future.

The University also has an official Coat of Arms, which represents and respects our historical roots.

The Coat of Arms consists of a shield, an escroll containing the motto and the wordmark in vertical format.

The shield consists of two parts, the upper part (the chief) separated from the lower (the base) by an arched line symbolizing the Chinook arch. The ground colour of the chief is scarlet, commemorating the North West Mounted Police under whose influence Western Canada was settled. Upon this colour is a pair of open books bound in gold. Between the books is a white rose, symbolic of Alberta. The ground colour of the base is gold, indicative of golden sunshine or golden grain. Upon this is a black bull's head with red horns and crossed staves bearing red flags, reminiscent of the family crest of Lt. Col. J.F. Macleod, the NWMP officer who founded Fort Calgary.

Below the shield, printed on an escroll, is the University's motto, "Mo shuile togam suas" (translated as "I will lift up mine eyes"), rendered in Gaelic uncial letters. The scroll is white; the draped ends are red. They were granted to the University in 1966 by Lord Lyon King of Arms at Edinburgh.

Official Colours

The University has two official colours: red and gold.

Tartan

The University of Calgary has an official tartan that incorporates the University's official colours of red and gold in its design. It was designed by Jim Odell, a University of Calgary Education and Fine Arts graduate and accredited in a 2001 ceremony presided over by Duncan Paisley of Westerlea, President of the Scottish Tartans Society and director of the Register of All Publicly Known Tartans.

The Mace

Certain formal occasions involve the use of special regalia, the significance of which is now symbolic but most of which has practical origins. In early times the mace was used first as a weapon to protect and second as a symbol of authority.

The mace carried into Convocation is a symbol of the authority of the Chancellor. It represents the Crown and the authority vested in the Chancellor to grant degrees. It is always carried in front of the Chancellor at Convocation. One interesting tradition in the use of maces is that if the real authority (the Queen) was present in person, the mace would be inverted.

Administration and Governance

For information about senior administration and administrative departments, please visit: ucalgary.ca/administration/.

Historical Highlights

1922

- Calgary Normal School (formerly Alberta Normal School) relocates onto the Institute of Technology and Art campus (now SAIT).

1945

- The Normal School becomes a southern extension of the U of A Faculty of Education.

1946

- Citizens form the Calgary University Committee.

1947

- The Calgary Branch of the U of A offers the first two years of a Bachelor of Education degree. A.L. Doucette is appointed the first director. Land is set aside in Houndsfield Heights for an eventual university.

1950

- The Board of Governors at the U of A sells all land south of 24th Avenue because the Calgary Branch of the University of Alberta would never grow large enough to use it.

1951

- First years of the BA and BSc are offered.

1953

- First year of BComm is offered.

1957

- The name changes to University of Alberta in Calgary (UAC). By now the first years of the BSc (Eng) and BPE are offered.

1958

- Sod-turning for the present campus. The Department of Public Works begins levelling the land.

1960

- The new campus opens with two new buildings, Arts and Science A. McMahon Stadium opens. M.G. Taylor is appointed principal.

1961

- The name changes to University of Alberta, Calgary. The first physical education building opens.

1962

- The 80-acre research park is designated. Campus patrol arrives. Full degree study is offered.

1963

- Students begin a drive for autonomy from the University of Alberta.

1964

- H.S. Armstrong is appointed President. Name changes to University of Alberta at Calgary. The football Dinos begin to play.

1965

- On May 1 UAC is granted academic and financial autonomy. The residence complex, Calgary Hall (now Craigie Hall), Science B and the Meteorological Station are completed. The Faculty of Engineering and the Division of Continuing Education are founded.

1966

- The *Universities Act* passes, creating The University of Calgary. F. C. Manning is appointed as the first Chair of the Board of Governors. The Senate and School of Social Welfare are established.

1967

- The first convocation is held March 29. The first recipient of a degree, Doctor of The University of Calgary, is Lester B. Pearson. Faculties of Business and Fine Arts are established.

1969

- A.W.R. Carrothers is named President. School of Nursing is established. More buildings open: Social Sciences, Mathematical Sciences and Physical Plant.

1970

- General Faculty Council is renamed General Faculties Council. First students are admitted to the Faculty of Medicine.

1971

- Faculty of Environmental Design is established. Four year degree programs begin.
- Dinnies Den opens as the first pub on campus.

1974

- W.A. Cochrane is named President.

1975

- Faculty of Law is established.

1976

- Faculty of Arts and Science is divided into the University College and the Faculties of Science, Social Science, and Humanities. Day Care Centre opens. Arctic Institute of North America is relocated here.

1978

- Norman E. Wagner is named President.

1979

- The Canadian Institute of Resources Law is established.

1981

- The University College becomes the Faculty of General Studies.
- The University of Calgary Press is established.

1982

- The University of Calgary is selected as the 1988 Olympic Games venue for the athletes' village and speed-skating events.

1984

- A $17 million supercomputer is acquired.

1985

- Calgary Hall is re-named Craigie Hall in memory of former Vice-President (Academic) Peter Craigie.

1988

- The Winter Olympics come to campus.
- Murray Fraser is named President.

1991

- The University celebrates its 25th anniversary.

1992

- NASA space shuttle Columbia blasts off carrying a University of Calgary science experiment.

1993

- The University raises more than $45 million in its first national fundraising campaign. Students commit $2.2 million to the Building on the Vision campaign.

1994

- The University of Calgary hosts the 1994 Learned Societies Conference in June and welcomes a record 8,100 delegates representing 105 societies and conferences from 24 countries.

1995

- Site dedication ceremony held for the new Rozsa Centre.

1996

- Terry White is appointed President.

1997

- The university launches U of C 101 - a four-day orientation session for new students and the first program of its kind in Canada.

1999

- Largest Information Commons of its kind in North America opens in MacKimmie Library.
- New 400-bed Cascade Hall residence welcomes students.

2001

- Dr. Harvey P. Weingarten is appointed as seventh President and Vice-Chancellor of the University of Calgary.

2003

- The Libin Cardiovascular Institute of Alberta is created with a $15-million gift from the Alvin and Mona Libin Foundation and a $5-million donation by David and Gail O'Brien helped launch a world-class undergraduate educational centre in the Faculty of Medicine.

2004

- Allan Markin, chairman of Canadian Natural Resources, donates $18 million to establish an Institute for Public Health.

2005

- Seymour Schulich donates $25 million to the university's engineering faculty. The faculty is renamed the Schulich School of Engineering in honour of the donation.

2006

- The university marks its 40th anniversary with a series of celebrations touching on almost every area of the campus community.

2007

- Official opening of a branch campus called University of Calgary-Qatar, will bring state-of-the-art nursing education, in Qatar's capital city of Doha.

2008

- University of Calgary launches Canada's fifth veterinary program in the new Faculty of Veterinary Medicine.

2010

- Elizabeth Cannon, Dean of the Schulich School of Engineering, is selected as the University of Calgary's eighth president and vice-chancellor.

2011

- Taylor Family Digital Library (TFDL) opens January 2011.
- The new Energy Environment and Experiential Learning (EEEL) Building opens.

2013

- The Taylor family donates $40 million to establish the Taylor Institute for Teaching and Learning.
- The Faculty of Education is re-named Werklund School of Education in recognition of Dr. David P. Werklund's $25 million donation.

2014

- The University of Calgary is named the number one university in Canada under the age of 50 and ranked as one of the top ten young international universities.
- The Faculty of Medicine was named the Cumming School of Medicine in honour of a $100 million donation from Geoffrey Cumming.

2015

- Two new residences: Aurora Hall (for undergraduate students) and Crowsnest Hall (for graduate students) open on main campus.

Research Centres, Groups and Affiliations

The University of Calgary is a comprehensive academic and research institution, with a mission to discover new knowledge and translate our discoveries into applications that provide benefits to our society and global communities. It is the creation of new knowledge in all forms that distinguishes us as a research university.

For more information on research at the University of Calgary refer to: ucalgary.ca/research/.

International Education Strategy

The University of Calgary Academic Plan, 2012-2016 has identified Internationalization as one of seven institutional priorities.

"We will create a campus that also attracts scholars from around the world to this hub – one that promotes diversity of thought, culture, and respect for alternatives. We will leverage our expertise to share capacity with targeted institutions in the developing world." Academic Plan 2012-2016.

"Becoming a Global Intellectual Hub", the International Strategy (2013) ucalgary.ca/uci/files/uci/international-strategy-final-sm.pdf has stated four goals for the University of Calgary:

1. Increase the diversity of the campus community: including a target to increase the percentage of international students to 10 per cent of the undergraduate student body and 25 per cent of the graduate student body.
2. Improve global and cross-cultural competencies within the campus community: including a target to have 50 per cent of domestic undergraduate students offered opportunities for study abroad; and increasing cross-cultural competencies through on-campus experiences.
3. Enhance opportunities for international collaborations and partnerships in research and education.
4. Leverage our unique areas of expertise to engage in international development.

"Our University will be a *global intellectual hub* where our students, staff, and faculty at the centre of this hub will radiate new discoveries, ideas, and applications that have global impact." Academic Plan 2012-2016.

We are committed to raising the profile of the University of Calgary worldwide, making it an attractive destination for international students, academics and researchers. As well, we provide options for students to study around the world as part of their University of Calgary degree. Problems are international in their dimensions and require global solutions as countries are linked culturally, economically and ecologically. University graduates require skills which enable them to find solutions in a world characterized by a diversity of languages, religions, living standards, technological standards, historical perspectives and cultural values.

The University of Calgary has over 3200 international students registered on campus (Fall 2015) from over 100 countries. In addition, our alumni, including Canadians, are living in all areas of the world, proving the importance of an international education. The University of Calgary offers major entrance scholarships and awards for first year undergraduate international students

as well as awards for continuing students as a part of the University of Calgary support for internationalization and to international students.

The University of Calgary has agreements to receive funded/scholarship students from a number of countries at both the graduate (Masters and Doctoral) and undergraduate (Baccalaureate) level. We encourage international graduate and undergraduate students to consider spending time at the University of Calgary working with academics in disciplines assisting in cutting edge research.

"Calgary is a global community – and we must prepare our graduates to work in a globalized world." Academic Plan 2012-2016.

The University of Calgary has developed an ambitious plan that would encourage 50 per cent of undergraduate students to have a study abroad or international experience. Undergraduate programs provide an international component to programs which may include study abroad (Student Exchange, Group Study Programs, research, practicum, Internships or independent study). Students may enhance their academic program, employment prospects and personal growth by studying abroad for a term or year.

The University of Calgary offers study abroad options in more than 50 countries including: Student Exchange Programs for a term or full year; Semester At Sea for business students; Field Schools and Term Abroad Programs to selected sites which offer intensive study opportunities abroad with University of Calgary faculty members during Spring and Summer Intersession, Block Weeks and some full terms. Students may also use their initiative to design their own program of study or undertake a research project.

While some study programs require knowledge of a language other than English, not all the University of Calgary exchange partners expect a student to be fluent in order to participate. It is possible to combine study abroad with language learning.

Students unable to study abroad may get involved with international activities on campus: volunteering with international offices such as UCInternational or International Student Services taking part in events to promote discussion and an international understanding.

"We will leverage our expertise to share capacity with targeted institutions in the developing world. International partnerships will be equitable, respectful of differences in culture, and mutually beneficial. We will be a global source for objective information, expertise, and productive collaborations across all sectors of government, industries, and non-governmental organizations." Academic Plan 2012-2016.

The University of Calgary has over 250 international partnerships that include collaborative research, joint academic and scientific studies, collaborative degrees and student exchanges, training programs, internships and practicums. University of Calgary staff/faculty have led development projects in Water Management in Central and South America; Maternal Child Health in Tanzania; Health Care Accessibility, Rehabilitation and Education in South Sudan. University of Calgary students may complete a summer-long internship/practicum through our participation with NGO's in Ghana.

The University of Calgary operates a branch campus "UC Qatar" opened in Fall 2007, offering a Bachelors of Nursing and post-degree diploma programs to residents of the Gulf region. The University of Calgary celebrated its first graduating class from UCQatar in June 2010 and in addition to Baccalaureate degrees, UC Qatar offers a Master's Program.

FastFacts

- In October 2014, the University opened a "Global Research Initiative" facility in Beijing China. This co-operative venture in unconventional oil and gas is a unique venture in co-operation with private interest and major universities in China.
- There are more than 3200 international students at the University of Calgary and the five countries from which we receive the largest number of international students are: China, Iran, India, the USA, and Saudi Arabia.
- The University of Calgary has developed a "Global Energy MBA" program which is unique in drawing on resources in the oil and gas industry in Calgary and from major centres around the world.
- Through the American Friends of the University of Calgary, Antje Graupe Pryor Foundation, the UCalgary International Studentships and the new 50th Anniversary International Exchange Awards, the University of Calgary awards more than $1 million for students spending a period of time studying abroad.
- The Student Refugee Committee of the Students' Union sponsors two new refugee students at the University of Calgary each year through World University Services of Canada (WUSC).
- New student orientation programs assist international students to become comfortable with their new environment. Opportunities include a "Buddy" or "Mentor" program for new students.
- The top destination countries for University of Calgary exchange programs are Australia, the UK, South Korea and the Netherlands.
- The University of Calgary offers Semester Abroad programs for architecture and design graduate students in the Fall Term in Barcelona, Spain and/or Melbourne, Australia.
- In 2015, more than 1000 (est.) University of Calgary undergraduate students studied abroad as part of their degree programs. Many participate in spring or summer schools abroad.

Main Offices Involved in International Education

University of Calgary International (Partnerships, Delegations, International Development)

Room 301 Mackimmie Block

Telephone: 403.220.7702

Fax: 403.289.0171

Email: uci@ucalgary.ca

ucalgary.ca/uci

Centre for International Students & Study Abroad (CISSA)

Room 275 MacEwan Student Centre

Telephone: 403.220.5581

Fax: 403.289.4409

Email: cissa@ucalgary.ca

International Student Recruitment & Prospective Student Information

Main Floor MacKimmie Block

Telephone: 1+403.210.7625

ucalgary.ca/prospectivestudents

ucalgary.ca/admissions

Faculty of Graduate Studies

Room 213 MacKimmie Tower

Telephone: 403-220-4938

Email: graduate@ucalgary.ca

Make Your Degree More International

The University of Calgary is committed to preparing its students for life in an increasingly global economy and society. An International Component will be part of every undergraduate student's degree program at the University when the current curriculum changes are finished, and are already a requirement of many programs. An International Component will provide students with an understanding of international relationships and issues with a particular view to the benefits and challenges of interaction of peoples, cultures and environments around the globe. It provides opportunities to develop an awareness of international, multicultural or aboriginal perspectives.

All students are encouraged to enrich the international component in their program by including several of the following courses in a degree program. Please note that some of the following courses have prerequisites or other registration restrictions. The courses can be taken as part of a major field or minor or among the degree options:

African Studies 301, 400, 501

Anthropology 203, 213, 303, 313, 317, 319, 321, 323, 329, 331, 341, 343, 349, 355, 357, 371, 363, 379, 385, 393, 405, 421, 435, 441, 467, 479, 523, 535, 541, 589

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Archaeology 205, 303, 305,306, 307, 317, 321, 325, 335, 341, 343, 345, 347, 351, 353, 355, 357, 395, 399, 401, 411, 419, 423, 437, 439, 443, 455, 503, 521, 523, 531, 537, 553, 589, 591, 593

Architectural Studies 457

Art History 323, 325, 357, 359, 365, 367

Biology 307, 309, 451

Canadian Studies 333, 361

Central and East European Studies 313

Chinese 205, 207, 229, 301, 303, 311, 313, 317, 331, 333, 355, 431, 461

Communication and Culture 301, 303

Communication and Media Studies 401.14, 401.17, 401.21, 401.22, 401.23, 401.24, 401.27, 401.31

Dance 427, 574

Development Studies 201, 375, 400, 403, 405, 485, 591

East Asian Studies 319, 321

Economics 321, 327, 337, 423, 425, 527, 537

English 385, 391, 490, 491, 493, 515

Film 301

Finance 461

French 209, 211, 213, 339, 343, 369, 399, 439, 449, 459, 499, 539, 549, 599

Geography 211, 213, 251, 321, 365, 367, 371, 377, 391, 397.01, 397.02, 397.03, 425, 429, 451, 463, 591, 593

Geophysics 375

German 200, 202, 204, 317, 331, 333, 349, 353, 357, 359, 369, 451, 469, 497, 551, 561, 591

Greek 201, 203, 301, 303, 401, 551

Greek and Roman Studies 205, 209, 305, 315, 321, 325, 327, 355, 357, 431, 455, 457, 551

History 200, 201, 202, 203, 204, 209, 211, 213, 303, 305, 307, 317, 319, 326, 327, 333, 336, 337, 338, 340, 345, 347, 349, 354, 357, 359, 361, 365, 367, 372, 381, 383, 395, 397, 404, 406, 412, 413, 425, 426, 427, 431, 435, 436, 439, 442, 443, 447, 450, 458, 459, 460, 461, 462, 463, 464, 465, 467, 471, 472, 473, 476, 483, 485, 486, 487, 488, 489, 490, 491, 495, 504, 508, 517, 520, 526, 527, 528, 529, 535, 537, 541, 543, 565, 569, 547

Indigenous Languages 205, 207

Indigenous Studies 201, 303, 305, 311, 312, 317, 343, 397, 399, 401, 407, 415, 502, 503

International Relations 501, 597

Italian 201, 203, 301, 309, 401, 405, 407, 409, 499, 501

Japanese 205, 207, 301, 303, 317, 331, 333, 341, 461

Kinesiology 487

Latin 201, 203, 205, 207, 301, 303, 401

Latin American Studies 301, 303, 401, 501

Linguistics 531

Management Studies 571

Marketing 467

Music 303, 403

Philosophy 335

Political Science 279, 283, 359, 369, 371, 381, 435, 439, 453, 455, 463, 465, 469, 470, 471, 473, 477, 479, 483, 485, 487, 491, 523, 561, 569, 571, 575, 577, 579, 581, 585, 587

Religious Studies 201, 203, 305, 313, 319, 323, 325, 327, 329, 339, 341, 353, 381

Romance Studies 299, 399

Russian 201, 209, 301, 303, 317, 331, 333, 355, 361, 363, 397, 401, 403, 451, 461, 463, 497, 551, 561

Slavic 355

Sociology 307, 375, 467, 487

South Asian Studies 303, 499

Spanish 201, 203, 301, 303, 321, 323, 405, 407, 421, 423, 441, 471, 473, 475, 499, 505, 553, 555, 557, 571, 581, 583, 593, 599

Strategy and Global Management 571, 573, 575

Women's Studies 301.01

In addition to the credit opportunities listed above, University of Calgary students can participate in a wide variety of non-credit activities that contribute to the international dimension of university experience. Contact the Centre for International Students and Study Abroad (CISSA) for suggestions.

Alcohol Policy (Use of)

The Use of Alcohol policy deals with the consumption of alcoholic beverages on the campus and at University functions. No one may bring or consume liquor on campus except as permitted under the University's Institution License from the Alberta Gaming and Liquor Commission.

Details regarding the University's liquor policy may be obtained from Risk Management & Insurance under Policies and Guidelines. See Special Events & Use of Alcohol: ucalgary.ca/riskmgmt/home/policies-procedures-handbooks-legislation/alcohol-policy-use.

If there are concerns about student misconduct, please refer to: ucalgary.ca/conduct/.

Smoking Policy

The University strives to provide a safe and healthy work, learning and living environment for all staff, faculty, students and visitors. Smoking is not permitted indoors nor within 7.5 metres of building entrances and air intake vents. Please respect everyone's right to clean air and a healthy environment.

For details see the Smoking Policy at: ucalgary.ca/policies/files/policies/smoking-policy.

Scent-Free Initiatives

There is a growing understanding that the health of some people is adversely affected by exposure to scented products. There are members of our community who may not be able to use facilities such as study spaces, libraries, theatres, classrooms, and work spaces due to the presence of scented personal care products.

Please see the website ucalgary.ca/safety/indoor for information about the health effects related to scented personal care products and alternatives that you can choose.

Glossary of Terms

The following is a glossary of terms often encountered by students. This list is not intended to be exhaustive.

Academic Program: A set of courses, a number of which may be mandatory and of a specialized nature, leading toward a particular degree.

Academic Year: Begins on the first day of July and ends the last day in June. The University operates three academic sessions during the year.

Baccalaureate: An undergraduate degree awarded by the University upon the successful completion of an academic program. Commonly referred to as a bachelor's degree.

Change of Program: Students in a program may elect to pursue a different program within their Faculty or enter a new program in a different Faculty. A Change of Program may be completed through the online Student Centre via MyUofC.

Co-operative Education/ Internship: The process of education which formally integrates academic study with work experience in co-operating employer organizations. The following Faculties offer certain programs in Co-op or Internship education: Arts, Haskayne School of Business, Medicine, Schulich School of Engineering and Science.

Corequisite: A course the content of which is integrated with that of another course such that the courses must be taken simultaneously.

Course: A unit of instruction that will be recorded on the student transcript with a final letter grade. Courses can have different credit or unit values.

Course Numbering System: Junior courses - courses numbered from 100-299. Senior courses - courses numbered from 300-599. Courses numbered 600 and above are normally restricted to students completing graduate programs. Normally a "full" course (6 units) is offered for twenty-six weeks; a "half" course (3 units) or less is offered for thirteen weeks.

Cross-listed Courses: Courses that are listed under two Departments and can be taken for credit from either Department, but not both. The credit is determined by the student's registration.

Deadline: A date by which specific actions/requirements must be satisfied such as drop/add or fee payment deadline. Deadlines are enforced at the University of Calgary.

Deferred Final Examinations: Examinations scheduled by the Registrar for students unable to write regularly scheduled final examinations for reasons of illness, domestic affliction or religious conviction.

Deferred Term Work: A temporary extension of time granted at the discretion of the Dean of the Faculty offering the course for completion of course requirements. Permission for Deferred Term Work is granted for reasons of illness, domestic affliction or religious conviction.

Discipline: A subject of study within a Department or Faculty.

Elective: Another word for option. Degree Navigator uses the term elective.

Field: A set of courses identifying the main area of study of a degree program.

Full Course: A course offered over two consecutive sessions for a total of twenty-six weeks and are equivalent to 6 units. These courses are denoted by an "F" in the Schedule of Classes.

Full-Course Equivalent (FCE): In addition to units, degree requirements can be listed in terms of full-course equivalents; most degree programs require 120 units or 20 full-course equivalents. A full-course equivalent may consist of one full course (6 units) or two half courses (3 units each).

Full-Time Student: Those students in a degree program who are registered in three or more courses or 9 units each Fall or Winter Term. The minimum for Spring or Summer Term is at least two courses or 6 units per term.

GPA: Abbreviation for grade point average.

Grade Point: Positive numerical value given to an alphabetical letter grade used in assessment of academic performance such as in the calculation of grade point averages. See "Undergraduate Grading System" in this Calendar for details.

Half Course: A course offered over one session for a total of thirteen weeks and is equivalent to 3 units. These courses are denoted by an "H" in the Schedule of Classes.

Half-Course Equivalent (HCE): In addition to units, degree requirements can be listed in terms of half-course equivalents; most degree programs require 120 units or 40 half-course equivalents.

Internship: See Co-operative Education/Internship above.

Major: The primary area of specialization in either a General or Honours program. Details of course and grade point average requirements are given in Faculty program sections of this Calendar.

Minor: A secondary area of specialization completed by a student in a subject outside the "Major" area. Minor program requirements are described in Faculty program sections of this Calendar.

Open Studies: A student who is permitted to register in credit courses, but who is not admitted to a program leading to a degree or diploma. This has also previously been known as an Unclassified Student.

Option: A course, acceptable within the academic program but chosen at the discretion of the student.

Part-Time Student: Those students in a degree program who are registered in fewer than three half-courses or 9 units each term.

Prerequisite: A prior requirement for entry into a course. Where a course is specified as a prerequisite, pass standing in the course is required unless a specific grade is indicated.

Probation: A trial period for a student whose registration is subject to academic conditions. Failure to satisfy these conditions may result in the student being required to withdraw from the University.

Registration: The selection of courses once a student has been admitted to the University.

Term: The University offers three terms during the year as follows - Fall Term (13 weeks from September to December), Winter Term (13 weeks from January to April), Summer Term (12 weeks from May to August). The University may also use “session” or “semester” in the same sense.

Transfer Credit: Courses completed at other post-secondary institutions and accepted for credit towards a degree program at the University of Calgary.

Transfer Student: Transfer students are those who have attended any post-secondary institution.

Tuition Fees: Fees paid for enrolment in courses.

Unclassified Student: see Open Studies.

Unit: A value, or weighting, assigned to a course counting towards a degree or diploma. The term "credit" is also used. In 2007 the University of Calgary implemented a new computer system where the "unit" became the primary measurement of course weighting. Previously, courses were known as Full, Half, Quarter and Eighth Courses. Generally, these were converted as a full course = 6 units, a half course = 3 units, a quarter course = 1.5 units and an eighth course = 0.75 units. There are remnants of this system throughout the Calendar. Most degree programs require 120 units (20 full courses or FCE).

Visiting Student: A visiting student is a student who has not been formally admitted to the University but who, as a bona fide student of another accredited degree granting institution, is permitted to take courses for credit at the University of Calgary to be applied to a degree program at the student's home institution.

Withdrawal: The formal procedure, according to regulations laid down by the University, of withdrawing from a course or courses, or from the University.

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