A Message from the Dean

As a new academic year begins, I welcome new and returning graduate students to the University of Calgary. You are valued members of our University’s community as students, as researchers and as teachers. Your success – whether in the laboratory, the classroom or the community – is also our success, and we are committed to providing the training and support you need to achieve it. As a vibrant and growing research-intensive institution, the University of Calgary is committed to training the next generation of scholars, practitioners and professionals.

Many resources are available to you during the course of your graduate education. The faculty members in your program, notably your supervisor, should provide mentorship both in the substance of your area of study and in your development as a professional and scholar in your field. The Graduate Students’ Association, the Student Success Center, the Center for International Students and Study Abroad, and the Wellness Center, among others, provide a wide range of services and support for graduate students over the course of their degree programs. I encourage you to familiarize yourself with these resources and make use of the assistance they can provide.

The Faculty of Graduate Studies provides leadership and support for excellence in graduate education. We are the faculty of registration for all graduate students; we also set admission and program standards, administer over $35 million annually in financial awards for graduate study, and promote uniform standards of excellence across programs.

You can contact us with questions about registration, fees, and scholarships, or to clarify the regulations contained in this Calendar. Students enrolled in thesis-based programs will complete their degree program by depositing their thesis with us. Please visit our offices (Earth Sciences 720) or contact us by telephone (403-220-4938) or e-mail (graduate@ucalgary.ca), and check our website for useful information (http://www.grad.ucalgary.ca/), including especially the Graduate Awards database.

Welcome from the Provost

Welcome to the 2011-2012 academic year at the University of Calgary. Though the university is relatively young in the context of many universities—we celebrated our 40th anniversary only five years ago—we pursue the highest levels of excellence in scholarship, research, and teaching, as is evidenced by our lofty position among the most research-intensive universities in Canada.

Graduate students are important members of the University of Calgary’s academic community. As well as taking courses and undertaking research, many of you will be engaged in teaching, either as teaching assistants or as teaching fellows. This experience will be an important element of your academic development, and, additionally, a valuable contribution to undergraduate education.

The Graduate Students’ Association (GSA) has become a strong and effective advocate for graduate students at the University of Calgary, and offers a number of opportunities that will expand your horizons and broaden your graduate experience. I encourage you to avail yourself of the services offered by the GSA, and to consider becoming engaged in the Association’s many activities.

Good luck for the coming year. May it be both successful and fulfilling.

Dr. Sandy Murphee,
Deputy Provost

This Calendar provides important information regarding the regulations of the University and of your program. It is your responsibility to know and comply with the relevant regulations of the University. Being familiar with the material contained in the Calendar will also assist you in setting a timetable for moving successfully through your program.

The on-line Calendar found at http://grad.ucalgary.ca/calendar is the official version, with this printed version just a snapshot in time of the constantly evolving Graduate Calendar. The on-line version will highlight changes that occur during the year. Any student may choose to remain with the regulations as they were upon her or his entering the program, but we anticipate that changes will always improve the graduate program, and therefore is to the student’s advantage.

I wish you every success in your studies in the coming year.

Dr. Lisa Young
Interim Vice-Provost (Graduate Education) and Dean of Graduate Studies
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For detailed information about Law and Medicine (MD), please consult the individual Faculty calendars. The online Graduate Calendar is the official University Graduate Calendar. The Calendar is available in electronic form on our website: http://www.grad.ucalgary.ca/

## Calendar Production

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

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**Editor:** Carol Poland, Enrolment Services  
**Technical Production Specialist:** Philip Tsang, Enrolment Services  
**Production Manager:** Bonnie Aun, Imagine Printing Services  
**Cover Design:** Imagine Services

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The University of Calgary is located at:  
2500 University Drive N.W.,  
Calgary, Alberta, Canada  
T2N 1N4

**Main Switchboard:** 403.220.5110

**Web address:** http://www.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 Graduate 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, lock-outs, 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.

The Graduate Calendar is available online in electronic form on the Faculty of Graduate Studies Web site at http://www.grad.ucalgary.ca/. The online Calendar is the official University Calendar.

Faculty of Graduate Studies
Interim Dean:
Lisa Young
Associate Deans:
Lisa Hughes
George Schimizu
David Westwick
Frans van der Hoorn (Medicine)
Office Staff:
Gillian Robinson, Graduate Associate Registrar (Student Services)
Lindsey Rose, Graduate Associate Registrar (Policy and Planning)
TBA, Special Projects
Marilyn Mooibroek, Graduate Student Professional Development & Postdoctoral Program Coordinator
Robin Slot, Budget Manager
Erin Coburn, Graduate Scholarship Officer
Brad Drebit, Graduate Scholarship Officer
Cristina Rai, Graduate Scholarship Officer
Cathie Stiven, Manager, Graduate Awards
Catalina Kovacs, Graduate Program Officer
Calvin Lac, Graduate Program Officer
Diane McNlnes, Graduate Program Officer
TBA, Graduate Program Officer
Corey Wilkes, Graduate Program Officer and Team Lead (Registrations)
Vanessa Gee, Faculty Administrative Assistant
Monica Gollaz, Faculty Administrative Assistant
Nurani Mawji, Administrative Assistant, Financial

Graduate Students’ Association (GSA)
The Graduate Students’ Association (GSA) was formed in 1967 with the aim of promoting and serving the intellectual, cultural and social interests of graduate students of the University. The GSA is dedicated to enhancing the experience of all graduate students and represents the collective interests of nearly 6,000 graduate students to the university, the Calgary community, and all levels of government.

GSA Membership
Membership in the GSA consists of active members, associate members and honorary members. All students registered as full or part-time graduate students in the Faculty of Graduate Studies, the Faculty of Environmental Design, and those in Post-Degree Continuous Learning programs are active members. Active members must pay the annual GSA fee, and automatically become members of The Last Defence Lounge.

GSA Executive
The affairs of the GSA are managed by an executive body called the Board of Directors (BoD) which is elected each spring for a one-year term. The positions include: President, Vice-President Academic, Vice-President Student Life and Vice-President Finance and Services. The Executive’s goals are facilitated by a team of full-time staff members who manage the day-to-day affairs of the GSA, and report directly to the elected BoD.

Graduate Representative Council (GRC)
The Graduate Representative Council (GRC) meets once a month and reviews and monitors GSA policies, practices and activities as reported by the BoD at each GRC meeting. In addition it ratifies the GSA’s annual draft budget. GRC meetings are an opportunity to network and catch up on all the important happenings across campus. Every department in every faculty is guaranteed one or more GRC representatives based on departmental graduate enrolment figures. Representatives are normally elected by their department's
graduate students in the fall term to act as liaisons between the GSA and their Departmental Graduate Associations (DGAs). It is the GRC that gives direction to the elected Executive body.

**Departmental Graduate Associations (DGAs)**

Through the GSA, each department of the university is able to form a Departmental Graduate Association (DGA). Start-up grants, the ability to apply for group funding, and receiving a discount for DGA functions at The Last Defence Lounge are just some of the benefits for DGAs. Many departments already have DGAs and the GSA encourages you to join yours—not only because it allows you to network within your department, but it fosters a stronger sense of community for graduate students. If your department doesn’t have a DGA and you’d like to form one, the process is quite simple: just stop by the GSA Main Office for more information or visit: http://www.gsa.ucalgary.ca.

**Graduate Student Orientation**

Graduate Orientation is a free orientation session given for new September and January graduate student registrants. While it is not mandatory, the GSA highly recommends that all new graduate students attend—even if they’re U of C undergraduate alumni—in order to learn about the U of C graduate program, the GSA and countless other services/opportunities provided to graduate students. Plus, it gives graduate students a chance meet other graduate students. For more information on Graduate Orientation, please visit: http://www.ucalgary.ca/orientation/graduate.

**Graduate Student Representation (External and Internal)**

GSA representatives, including both the GSA executive and GRC representatives, sit as full voting members on most major committees of the university. As well, graduate students at the University of Calgary belong to provincial and national student organizations, such as the Alberta Graduate Council and the G13.

**The GSA Office and The Last Defence Lounge (LDL)**

The GSA main office is located on the third floor of the MacEwan Student Centre (MSC 350) which houses all of the GSA’s operations, including the Health and Dental Plan. Adjacent to the office is The Last Defence Lounge: a members-only lounge to which all members of the university community, and their guests, are welcome. Simply show your Campus ONEcard (UCID) to gain access to the lounge. There is no charge for membership. Please note, proof of age ID may also be required. For the latest lounge news, from events to daily specials, please visit: http://www.lastdefence-lounge.ca.

**GSA Services**

The GSA provides many key services to graduate students, such as offering a Health and Dental Plan for all active members. The plan encompasses a wide variety of coverage at competitive rates and allows students to access critical services—from antibiotics and psychiatry to naturopathy and dental work. The GSA also provides a Career and Mentorship Program to help graduate students attain their desired career goals—whether this means re-entering industry after graduation or continuing on with academia. To contact the Career and Mentorship Graduate Program Director, email: careers@gsa.ucalgary.ca. The University of Calgary also has an Ombudsperson available as a neutral party to help guide students through U of C policy and answer any questions they may have about their rights as students. To contact the U of C Ombudsperson, please email: ombuds@ucalgary.ca. As well, each spring, the GSA participates in the Alberta Graduate Conference: an inter-disciplinary conference for all graduate students in Alberta. This is a great way to get involved, get credit for your CV and meet other graduate students. For more information, you can visit: http://www.albertagrads.ca. Through the GSA, graduate students also have access to GSA bursaries and awards, various academic and professional skills workshops, and much, much more. To access a complete list of GSA services, visit the GSA website at: http://www.gsa.ucalgary.ca/. If you ever have questions or need help, please don’t hesitate to stop by the main office—the GSA is here to help you!

**GSA Contact Information:**

The Graduate Students’ Association 350, MacEwan Student Centre 2500 University Drive NW Calgary AB T2N 1N4 Tel: 403.220.5997 Fax: 403.282.8992 http://www.gsa.ucalgary.ca

**GSA Office Hours:**

Monday to Friday 8:30 AM to 12 PM and 1 PM to 4:30 PM

**Message from the GSA President**

On behalf of the Graduate Students’ Association (GSA), I am pleased to welcome you to the University of Calgary. I would like to wish you every success in your graduate work and I know that you will enjoy a fulfilling experience at one of Canada’s top research universities.

The Graduate Students’ Association, now in its forty-fourth year of operation, exists to represent and serve all graduate students at the University of Calgary. As a student-run organization, the GSA works hard with our full-time staff members to organize a host of activities to entertain and enrich the graduate student experience, including academic and professional skill development workshops, intramurals, and social events.

The GSA is here for you. We represent the interests of graduate students at the University of Calgary to the university administration, all levels of government, and the Calgary community. We work closely with our various lobby groups and other graduate student organizations to ensure your needs and interests are represented. In order to succeed, however, we need your input. There are many ways to get involved: send us an e-mail telling us what you want; participate in one of our campus-wide surveys; volunteer for Graduate Orientation; join or form your own Departmental Graduate Association (DGA); become your department’s rep to the Graduate Representative Council (GRC); or volunteer for a GSA standing committee. Remember, if your department doesn’t have a rep for GRC or a DGA, it’s easy to sign up—just contact the GSA main office and we’ll guide you through the process.

In addition to services and representation, the Graduate Students’ Association is responsible for The Last Defence Lounge, located on the third floor of the MacEwan Student Centre. It’s a great place to come for a meal, to attend GSA social events, or to enjoy a casual get-together with friends and colleagues.

On behalf of the entire GSA executive, the GRC and all the GSA staff, welcome to the University of Calgary. We hope you have a wonderful and productive year. For more information please check out our website at: http://www.gsa.ucalgary.ca.

Regards,
Franco A. Rizzuti GSA President 2011-12 pres@gsa.ucalgary.ca
### Academic Schedule

The University operates four terms during the academic year:

<table>
<thead>
<tr>
<th>Term</th>
<th>Duration</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Term</td>
<td>13 weeks</td>
<td>September to December</td>
</tr>
<tr>
<td>Winter Term</td>
<td>13 weeks</td>
<td>January to April</td>
</tr>
<tr>
<td>Spring Term</td>
<td>6 to 7 weeks</td>
<td>May to June</td>
</tr>
<tr>
<td>Summer Term</td>
<td>6 weeks</td>
<td>July to August</td>
</tr>
</tbody>
</table>

### Graduate Academic Schedule 2011-2012

Note: For a complete listing of dates applicable to the 2011 Summer Term, please refer to the 2011 Spring/Summer Guide available at the Special Sessions website: http://springsummer.ucalgary.ca/.

### JULY, 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Friday</td>
<td>• Canada Day, University closed.</td>
</tr>
<tr>
<td>2 Saturday</td>
<td>• Weekend University Summer Term lectures begin.</td>
</tr>
<tr>
<td>4 Monday</td>
<td>• SUMMER TERM LECTURES BEGIN. First-term and six-week courses.</td>
</tr>
</tbody>
</table>
| 8 Friday   | • Last day for registration and change of registration for Summer Term six-week and first-term half courses (without pre-session study).  
              • No fee refunds for withdrawals from Summer Term six-week courses and first-term half courses after this date. |
| 15 Friday  | • Fee payment deadline for Summer Term fees for six-week courses and first-term half courses.  
              • Fee payment deadline for second-term half courses. |
| 22 Friday  | • Last day of first-term lectures in Summer Term.                       
              • Last day to withdraw with permission from first-term courses in Summer Term. |
| 26 Tuesday | • First-term final examinations for Summer Term.                        
              • Mid-term break for six week courses. No lectures. |
| 28 Thursday| • Lectures begin for the second-term of Summer Term.                   |
| 29 Friday  | • Last day for registration and change of registration for second-term Summer Term (without pre-session study).  
              • No fee refunds for withdrawals from Summer Term second-term half courses after this date. |

### AUGUST, 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
</table>
| 6 Saturday | • Weekend University Summer Term lectures end.                         
              • Last day to withdraw with permission from Weekend University Summer Term courses. |
| 13 Saturday| • Weekend University Final Examinations                                |

### SEPTEMBER, 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Monday</td>
<td>• Labour Day. University closed.</td>
</tr>
<tr>
<td>6 Tuesday</td>
<td>• Fall Term begins.</td>
</tr>
<tr>
<td>6-10 Tuesday-Saturday</td>
<td>• Block Week.</td>
</tr>
<tr>
<td>10 Saturday</td>
<td>• Last day to withdraw with permission from Fall Term Block Week courses.</td>
</tr>
<tr>
<td>12 Monday</td>
<td>• FALL TERM LECTURES BEGIN (except Block Week courses).</td>
</tr>
</tbody>
</table>
| 23 Friday  | • Last day to drop full courses and Fall term half courses.            
              • No refunds for full courses (Multi-term) or Fall Term half courses after this date. |
| 26 Monday  | • Last day to add or swap full courses and Fall term half courses.     
              • Last day for change of registration from audit to credit or credit to audit. |
| 30 Friday  | • Fee payment deadline for Fall term full and half courses.            |

### OCTOBER, 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Monday</td>
<td>• Thanksgiving Day. University closed (except MacKinnie, Law, Medical, Gallagher and Business Libraries). No lectures.</td>
</tr>
</tbody>
</table>

### NOVEMBER, 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-13 Thursday-Sunday</td>
<td>• Reading Days. No lectures.</td>
</tr>
<tr>
<td>10 Thursday</td>
<td>• Fall Convocation.</td>
</tr>
<tr>
<td>DATE</td>
<td>EVENT</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>APRIL, 2012</td>
<td>• Good Friday, University closed (except MacKimmie, Law, Medical, Gallagher and Business Libraries).</td>
</tr>
<tr>
<td>13 Friday</td>
<td>• WINTER TERM LECTURES END. (For practicum students, the length of the term may be extended.)</td>
</tr>
<tr>
<td>16-25 Monday to Wednesday</td>
<td>• Winter Term Final Examinations.</td>
</tr>
<tr>
<td>26 Thursday</td>
<td>• Last day to register for Spring term first-term half courses, six week and thirteen-week courses (Multi-term) courses with pre-session study</td>
</tr>
<tr>
<td>30 Monday</td>
<td>• Winter Term ends.</td>
</tr>
<tr>
<td>MAY, 2012</td>
<td>9 Wednesday • SPRING TERM LECTURES BEGIN</td>
</tr>
<tr>
<td>10 Thursday</td>
<td>• May Convocation for Faculties of Law and Medicine</td>
</tr>
<tr>
<td>14 Monday</td>
<td>• Last day for registration and changes of registration for Spring term first-term half courses, six-week and thirteen-week courses (Multi-term) (without pre-session study).</td>
</tr>
<tr>
<td>31 Thursday</td>
<td>• First-term lectures in Spring Term end.</td>
</tr>
<tr>
<td>30 Monday</td>
<td>• Last day to withdraw with permission from first-term half courses in Spring term.</td>
</tr>
<tr>
<td>JUNE, 2012</td>
<td>1 Friday • First-term final examinations for Spring Term.</td>
</tr>
<tr>
<td></td>
<td>• Mid-term break for six-week courses. No lectures.</td>
</tr>
<tr>
<td></td>
<td>• Last day for registration and changes of registration for Summer Term courses (with pre-session study).</td>
</tr>
<tr>
<td></td>
<td>4 Monday • Lectures begin for the second-term of Spring Term.</td>
</tr>
<tr>
<td></td>
<td>4-8 Monday to Friday • Spring (June) Convocation for all faculties except Law and Medicine.</td>
</tr>
<tr>
<td></td>
<td>6 Wednesday • Last day for registration and changes of registration for Spring Term second-term half courses (without pre-session study).</td>
</tr>
<tr>
<td></td>
<td>• No fee refunds for withdrawals from Spring Term second-term half courses after this date.</td>
</tr>
<tr>
<td></td>
<td>21 Tuesday • Last day for registration and changes of registration for Summer Term courses (with pre-session study)</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>25 Monday</td>
<td>• SPRING TERM LECTURES END.</td>
</tr>
<tr>
<td></td>
<td>• Last day to withdraw with permission from full courses, half courses given over a six-week period and second-term half courses in Spring Term.</td>
</tr>
<tr>
<td>26-28</td>
<td>• Spring Term Final Examinations except first-term courses.</td>
</tr>
<tr>
<td>Tuesday-</td>
<td>• Mid-term break for thirteen-week courses. No lectures.</td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
</tbody>
</table>

**JULY, 2012**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sunday</td>
<td>• 2011-2012 Academic Year begins.</td>
</tr>
<tr>
<td>2 Monday</td>
<td>• Canada Day (Observed), University closed.</td>
</tr>
<tr>
<td>3 Tuesday</td>
<td>• SUMMER TERM LECTURES BEGIN.</td>
</tr>
<tr>
<td>5 Thursday</td>
<td>• Last day for registration and changes of registration (without pre-session study) first-term, six-week and second-term courses.</td>
</tr>
<tr>
<td></td>
<td>• No fee refunds for withdrawals from Summer Term first-term half courses and six-week courses after this date.</td>
</tr>
<tr>
<td>13 Friday</td>
<td>• Fee payment deadline for Summer Term first-term half courses and six-week courses.</td>
</tr>
<tr>
<td>23 Monday</td>
<td>• First-term lectures end in Summer Term.</td>
</tr>
<tr>
<td></td>
<td>• Last day to withdraw with permission from first-term half courses in Summer Term.</td>
</tr>
<tr>
<td>24 Tuesday</td>
<td>• First-term final examinations for Summer Term.</td>
</tr>
<tr>
<td></td>
<td>• Mid-term break for six week courses.</td>
</tr>
<tr>
<td>25 Wednesday</td>
<td>Lectures begin for the second-term of Summer Term.</td>
</tr>
<tr>
<td>27 Friday</td>
<td>• Last day for registration and change of registration for second-term Summer Term (without pre-session study).</td>
</tr>
<tr>
<td></td>
<td>• No fee refunds for withdrawals from Summer Term second-term half courses after this date.</td>
</tr>
</tbody>
</table>

**AUGUST, 2012**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Wednesday</td>
<td>Last day to submit Application for Degree for all degrees and diplomas to be conferred at Fall Convocation (see Graduation in Academic Regulations section of this calendar).</td>
</tr>
<tr>
<td>15 Wednesday</td>
<td>SUMMER TERM LECTURES END.</td>
</tr>
<tr>
<td></td>
<td>• Last day to withdraw with permission from full courses, half courses given over a six-week period and second-term half courses in Summer Term.</td>
</tr>
<tr>
<td></td>
<td>• Last day to withdraw with permission from thirteen-week courses (Multi-term) offered from May 10 to August 15.</td>
</tr>
</tbody>
</table>

**DATES TO BE DETERMINED**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Final Examinations for Summer Term except first-term courses.</td>
</tr>
</tbody>
</table>

**SEPTEMBER, 2012**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Monday</td>
<td>• Labour Day. University closed.</td>
</tr>
<tr>
<td>4 Tuesday</td>
<td>• Fall term begins</td>
</tr>
<tr>
<td>4-8 Tuesday-Saturday</td>
<td>Block Week</td>
</tr>
<tr>
<td>8 Saturday</td>
<td>• Last day to withdraw with permission from Block Week courses.</td>
</tr>
<tr>
<td>10 Monday</td>
<td>• FALL TERM LECTURES BEGIN (except Block Week courses).</td>
</tr>
<tr>
<td>21 Friday</td>
<td>• Last day to drop full courses and Fall Term half courses.</td>
</tr>
<tr>
<td></td>
<td>• No refunds for full courses (Multi-term) or Fall Term half courses after this date.</td>
</tr>
<tr>
<td>24 Monday</td>
<td>• Last day to add or swap full courses and Fall Term half courses.</td>
</tr>
<tr>
<td></td>
<td>• Last day for change of registration from audit to credit or credit to audit.</td>
</tr>
<tr>
<td>28 Friday</td>
<td>• Fee payment deadline for Fall Term full and half courses.</td>
</tr>
</tbody>
</table>

**OCTOBER, 2012**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Monday</td>
<td>• Thanksgiving Day. University closed (except MacKimmie, Law, Medical, Gallagher and Business Libraries). No lectures</td>
</tr>
</tbody>
</table>

**NOVEMBER, 2012**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-13 Saturday to Tuesday</td>
<td>Reading Days. No lectures.</td>
</tr>
<tr>
<td>13 Tuesday</td>
<td>• Fall Convocation</td>
</tr>
</tbody>
</table>

**DECEMBER, 2012**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Friday</td>
<td>• FALL TERM LECTURES END</td>
</tr>
<tr>
<td></td>
<td>• Last day to withdraw with permission from Fall Term half courses.</td>
</tr>
<tr>
<td>10-19 Monday to Wednesday</td>
<td>Fall Term Final Examinations and consolidated end-of-term tests in full courses.</td>
</tr>
</tbody>
</table>

**JANUARY, 2013**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tuesday</td>
<td>• New Year’s Day. University closed.</td>
</tr>
<tr>
<td>2 Wednesday</td>
<td>Winter Term begins.</td>
</tr>
<tr>
<td></td>
<td>• Lectures begin in Block Week courses.</td>
</tr>
<tr>
<td>2-7 Wednesday to Saturday; Monday</td>
<td>Block Week.</td>
</tr>
<tr>
<td>7 Monday</td>
<td>• Last day to withdraw from Block Week courses</td>
</tr>
<tr>
<td>8 Tuesday</td>
<td>• WINTER TERM LECTURES BEGIN (except Block Week courses).</td>
</tr>
<tr>
<td>18 Friday</td>
<td>• Last day to drop Winter Term half courses.</td>
</tr>
<tr>
<td></td>
<td>• No fee refunds for Winter Term half courses after this date.</td>
</tr>
</tbody>
</table>

**DATES TO BE DETERMINED**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Final Examinations for Summer Term except first-term courses.</td>
</tr>
</tbody>
</table>
### 21 Monday
- Last day to add or swap Winter Term half courses.
- Last day for change of registration from audit to credit or credit to audit.

### 25 Friday
- Fee payment deadline for Winter Term half courses.
- Spring and Summer Term Schedule of Classes will be available mid-January.

### FEBRUARY, 2013

<table>
<thead>
<tr>
<th>1 Friday</th>
<th>• Last day to submit Application for Degree for all degrees and diplomas to be conferred at May and Spring (June) Convocations (see Graduation in Academic Regulations section of this calendar).</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-24 Sunday to Sunday</td>
<td>• Reading Week. No lectures. University open (except Family Day).</td>
</tr>
</tbody>
</table>
| 18 Monday | • Alberta Family Day, University closed (except MacKimmie, Law, Medical, Gallagher and Business Libraries).
• Spring and Summer Term registration for continuing students begins early February. |

### MARCH, 2013

| 29 Friday | • Good Friday, University closed (except MacKimmie, Law, Medical, Gallagher and Business Libraries).
• Spring and Summer Term registration for Open Students and Visiting students begins early March. |

### APRIL, 2013

| 16 Tuesday | • WINTER TERM LECTURES END.
• Last day to withdraw from full courses and Winter Term half courses. |
| 19-30 Friday to Tuesday | • Winter Term Final Examinations. |
| 30 Tuesday | • Winter Term ends. |

**Note:** The dates for the 2012-2013 Academic Year are tentative and subject to review and change. For a multifaith list of holy days, please see the Enrolment Services website at: [http://www.ucalgary.ca/registrar/](http://www.ucalgary.ca/registrar/).
Faculty of Graduate Studies
General Information

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 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 $35 million annually in financial awards for graduate study.

Contact Information
Location: Earth Sciences 720
Faculty number: 403.220.4938
Fax: 403.289.7635
Email address: graduate@ucalgary.ca
Website: http://www.grad.ucalgary.ca

Summary of Degree Programs
The Faculty of Graduate Studies administers programs leading to the degrees of:
Doctor of Education (EdD)
Doctor of Philosophy (PhD)
Master of Architecture (MArch)
Master of Arts (MA)
Master of Biomedical Technology (MBT)
Master of Business Administration (MBA)
Master of Communications Studies (MCS)
Master of Disability and Community Studies (MDCS)
Master of Community Medicine (MCM)
Master of Continuing Education (MCE)
Master of Counselling (MC) (a Campus Alberta degree offered in conjunction with the University of Lethbridge and Athabasca University)
Master of Economics (MEc)

Degrees Offered

Table of Contents
Summary of Degree Programs..............................11
Degrees Offered.............................................11
Combined Degree Programs.................................12
Credit Certificate and Diploma Programs...............12
Degrees Offered
Please see “Degrees Offered” chart on page 11.

Master of Education (MEd)
Master of Engineering (MEng)
Master of Environmental Design (MEDes)
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 Project Management (MPM)
Master of Public Policy (MPP)
Master of Science (MSc)
Master of Social Work (MSW)
Master of Strategic Studies (MSS)

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, MPM/MBA, MBT/MBA, MSW/MBA, MSc/MBA, PhD/MBA, MD/Master’s and MD/PhD.

The University of Calgary also provides opportunities for excellent doctoral students to undertake doctoral studies in collaboration with other universities nationally and internationally through the Doctoral Cotutelle Program. A doctoral cotutelle is a PhD degree designed, supervised and examined by faculty from two universities and jointly awarded by both universities.

Information and application packages are available from the relevant graduate programs.

Credit Certificate and Diploma Programs
The Faculty of Graduate Studies administers programs leading to certificates and diplomas in Applied Psychology, Education, Law, Nursing, Radiation Oncology Physic and Social Work. The programs provide those who wish to continue their advanced education with an opportunity to acquire additional academic credentials in specific areas. These credentials may be used for credit toward a future degree. The graduate certificate and diploma programs will also be valuable to those who have completed a graduate degree but desire or require further credentials or knowledge and skills beyond their degree.

Please see Program entries in this Calendar for contact information regarding certificate and diploma programs.
Admissions

There is no general right of admission to Graduate Programs. Each department 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 availability, and other such considerations. Taking these considerations into account, graduate programs are expected to act in an equitable manner in their admission procedures.

A.1 Qualifications

Applicants must hold or obtain the following minimum qualifications before the Faculty will give consideration to admission:

1. A four-year baccalaureate degree or its equivalent from the University of Calgary or a recognized institution. Degrees and grades from foreign 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 of appropriate content for the graduate program applied for, and adequate senior level courses to ensure preparation for graduate work. Any graduate work is also 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 for exceptions and details.

Note: In exceptional circumstances, individuals who do not meet formal academic requirements but who have significant life achievements may be considered for admission to some graduate programs. The candidate must provide the relevant graduate program with evidence demonstrating a potential to undertake successfully the proposed program of studies. Such candidates are advised to make early contact with the graduate program. In all such cases, the decision whether or not to admit rests with the Dean of the Faculty of Graduate Studies.

2. Proficiency in the English language is essential for the pursuit and successful completion of graduate programs at the University of Calgary. Prior to admission to the Faculty of Graduate Studies, an applicant whose primary language is not English may fulfill the English language proficiency requirement in one of the following ways:

a) By writing the Test of English as a Foreign Language (TOEFL) and obtaining a score of at least 550 (written test) or 80 (internet-based test)

b) By writing the TOEFL Academic Test (PBT) and obtaining a score of at least 520, or by writing the TOEFL Internet-based Test (IBT) and obtaining a score of at least 80.

c) By writing the Michigan English Language Battery (MELAB) test and obtaining a score of 80. The MELAB test includes a written composition, a listening test, and a test of grammar, vocabulary, and reading comprehension. An optional speaking test is also available. The MELAB test is conveniently offered once a month at the University of Calgary by the Effective Writing Program. For test information and test dates, please see the MELAB tab at http://efwr.ucalgary.ca.

d) By successful completion of Tier 3 of the English for Academic Purposes (EAP) program. For information, see http://www.education.ucalgary.ca/eap/ or contact English for Academic Purposes, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4. Telephone: 403.220.3485; fax: 403.210.8554; e-mail: eapp@ucalgary.ca.

e) By completing the Pearson Test of English (PTE) and obtaining a score of at least 80.

The department or graduate program may waive the English proficiency-testing requirement in certain circumstances, such as the possession of a baccalaureate degree or its academic equivalent from a recognized institution in which the language of instruction is English. Contact the graduate program to which you plan to apply for further information.

Students who do not meet admission standards and wish to pursue graduate work are advised to enrol in the equivalent of a full year (a minimum of three graded full-course equivalents) at the senior undergraduate level in order to improve their academic record to acceptable admission standards (a grade of “B” or higher in every course). All such courses represent “make up” work and cannot be used for advanced credit towards a graduate degree program. Successful completion of “make up” work does not guarantee admission to a graduate program. Students are advised to discuss this option with the appropriate graduate program before embarking on such a course.

A.2 Application for Admission

Applications for admission to the Faculty should be submitted through the on-line application system, which can be accessed through program websites. No assurance can be given that applications received after the deadlines noted in the “Application Deadline” section of the appropriate program section of this Calendar will be processed in time to permit the applicant to register for the following session. Specific instructions for applicants are included with the application.

All applications to the Faculty of Graduate Studies of the University of Calgary must include the following:

a) A non-refundable application fee for each application to a graduate degree program. $100 for Canadian citizens or Permanent Residents, $130 for international students with a study permit. Cheques or money orders must be made payable to the University of Calgary. Applications will be processed only if the fee has been paid.

b) Official transcripts from all post-secondary institutions attended.

c) Official MELAB, TOEFL, IELTS, GMAT, PTE GRE scores and/or other requirements of the program for which application is being made.

d) Endorsement from the Head of the Department - It is the responsibility of the department or graduate program concerned to ensure that the applicant is, in all relevant respects, acceptable to the department and that the student’s proposed program is aligned with the availability of resources for adequate supervision and research, with departmental research objectives, and with program balance, as appropriate.

Please see program entries in this Calendar for any additional program requirements, including details on reference letters.

Normally, an appropriate letter of recommendation is one written by an independent individual who can provide an assessment of the applicant’s background and capabilities with respect to the prospective program. Letters from friends, family members, colleagues, people currently registered in a graduate degree program, or general reference letters that are not written in support of the person’s application to the particular graduate program are not acceptable. An applicant currently registered in a graduate degree program, or who has recently completed a graduate degree program, must submit one letter of reference from his/her program supervisor. Unless the applicant has been out of school for more than four years, at least one letter, and preferably both, should be by an academic. A reference from a non-academic source should come
Admissions

from a person who has had direct supervisory experience of the applicant. All graduate programs have limited enrolment capacities. Meeting the minimum requirements does not guarantee admission. If, at any time it is discovered that a student was admitted on the basis of falsified documents or information, the admission will immediately be declared null and void and future admission will be denied. Note: Advanced credit can be applied for only when applying for admission. See “A.6 Advanced Credit”.

Students will not normally be permitted to register in a University of Calgary degree or diploma program while simultaneously working toward another degree or diploma at the University of Calgary or at another institution. Joint degree programs are an exception to this regulation.

A.3 Admission Categories

Graduate students are admitted to the Faculty in one of the following categories:

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 degree in an area not sufficiently represented by one graduate program may be admitted both to a home program and a conjoint program in an interdisciplinary area of study, if one exists. The student should submit an application form and fee, along with official transcripts and letters of reference to the intended home graduate program. The prospective home program will liaise with the conjoint program. Contact the prospective home graduate program for further details.

Special Case Admission

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.

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Qualifying year will not count toward the tuition fee for the degree program.

Conditional Admission for Language Upgrading

An international student holding a scholarship from his/her government may be offered admission into a graduate program conditional on successful completion of the English for Academic Purposes program. In order to be admitted, the student must successfully complete Tier 3 of the EAP program by achieving a grade of “B” or higher in EAP 190 and a grade of “C” or better in all other EAP courses. Programs may require a higher level of achievement, which will be set out in the letter of conditional admission. Eligible students who are offered conditional admission must complete the EAP program within one year; after this time the conditional offer of admission is revoked.

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 his/her 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 files are forwarded to the Faculty of Graduate Studies in the normal way. 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 General

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 his/her home institution. An exchange student must submit the appropriate application/approval form (http://www.grad.ucalgary.ca/forms/registration). An exchange student pays tuition fees at the home institution when this is written into the specific exchange agreement, and applicable general fees at the University of Calgary. If there is no reciprocal fee agreement, the exchange student pays applicable tuition and general fees at the University of Calgary. Exchange student status does not guarantee admission to graduate programs at the University of Calgary. An exchange student who wishes to apply to a graduate program at the University of Calgary must do so in the usual manner.

Western Deans’ Agreement

The Western Deans’ Agreement covers graduate students from the following universities:

- Athabasca University
- British Columbia Institute of Technology
- Brandon University
- Concordia University College of Alberta
- Royal Roads University
- Simon Fraser University
- University of Alberta
- University of British Columbia
- University of Calgary
- University of Lethbridge
- University of Manitoba
- University of Northern British Columbia
- University of Regina
- University of Saskatchewan
- University of Victoria

A graduate student registered in the Faculty of Graduate Studies at one university may apply for student status at a university listed above by completing the appropriate application that requires the approval of the Graduate Director, and the Faculty of Graduate Studies at both the student’s home and host universities. Applications should be received in the Faculty of Graduate Studies at the host institution three months before the beginning of the term at the University of Calgary. The student pays tuition and general fees at the home university and applicable general fees at the host institution. The student is responsible for arranging for an official transcript to be sent from the host institution to the home institution when the course(s) has been completed. Each home institution has regulations regarding the maximum number of transfer credits permitted. Further information is available at http://www.grad.ucalgary.ca/policies/westerndeans.

Canadian Graduate Student Research Mobility Agreement

The Canadian Graduate Student Mobility Agreement, initiated by the Canadian Association of Graduate Schools (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. A faculty member at the host institution must agree to supervise and take responsibility for the visiting graduate research student during his/her stay. It is recognized that it is the responsibility of the visiting student to find a supervisor at the host institution. For further information, see the Faculty of Graduate Studies website.
A.4 Retention of Student Records

Graduate student files are kept electronically in the Faculty of Graduate Studies. All application documents submitted to the Faculty of Graduate Studies become the property of the University of Calgary and cannot be returned to the student.

When applying for admission to another program, an applicant who completed a graduate degree from the University of Calgary must submit such original transcripts of post-secondary education institutions attended as are required by the program or the Faculty of Graduate Studies, and appropriate letters of reference as required by the program.

A.5 Offer of Admission

An offer of admission to a graduate program shall specify the program to which the student is admitted in terms of available programs as specified in this Calendar. Any more detailed terms of admission applying to a particular offer shall be specified in the offer. Graduate programs will supply a program specification including the terms of admission to the Faculty of Graduate Studies when recommending that a student be admitted or admitting on behalf of the Faculty of Graduate Studies, and will ensure that copies of any documents cited in the specification are lodged with the Faculty of Graduate Studies.

The program specification shall include course requirements, any full-time requirements, and any other relevant program components. It shall also include any offer of funding and any conditions related to that funding, from the program.

An offer of admission to a prospective student who will attend for a qualifying year must include the courses the prospective student is expected to take to upgrade his or her background to enter the program proper. The offer must include the information that these courses, and the tuition paid during the qualifying year, will not count toward the degree program. No fee credit is given for courses that are taken as a qualifying student.

A student may request that the graduate program defer admission for up to one full year. Deferral is not automatic, and terms of the offer of admission may change. The request must be endorsed by the Graduate Program Director, and the prospective supervisor, where applicable.

If, during a student’s program, a change in the program is mutually agreed upon by the student and the graduate program, the program may be changed from that specified as part of the offer of admission, but such variation will not come into effect until it is approved by the Faculty of Graduate Studies. The Change of Program or Status form must be completed and submitted to the Faculty of Graduate Studies for approval (http://www.grad.ucalgary.ca/forms/registration).

A.6 Advanced Credit

Courses for which advanced credit is being sought must be from a recognized institution and not have been used for any degree or diploma accreditation. They must be graded, graduate level courses, and the graded level of performance must be equivalent to a “B” grade or higher standing at the University of Calgary.

The total of advanced credit and transfer credit may not exceed either one-third of the program or two full-course equivalents, whichever is less.

Advanced credit is not normally given for courses taken more than five years before admission to the current graduate degree program or for courses taken for the purposes of qualifying for admission.

Thesis-based programs: Application for credit should be made to the graduate program at the time of admission, so that the graduate program can take previous work into account when specifying a student’s program.

Course-based programs: The student must request advanced credit in writing at the time of application for admission, endorsed by the Graduate Program Director and submitted to the Faculty of Graduate Studies with the admission recommendation.

A.7 Readmission

A student who withdrew or was withdrawn from program and wishes to be readmitted to the program must apply for readmission to the graduate program, with submission of transcripts for any academic work done since departure and a fee of $180.

If readmission is granted, program requirements and completion time will be stipulated in the offer of readmission. Assessment of requirements for degree completion will take into consideration the relevance of work completed during the initial registration and current program requirements.

A fee assessment, taking into account the completed and remaining requirements and time in the student’s program, will be made as part of the offer of readmission.

A.8 Reactivation

A student who has been withdrawn for failure to register and who wishes to reactivate his/her registration, must submit a Faculty of Graduate Studies Annual Registration form, and a $180 fee. The student’s supervisor and Graduate Program Director must sign the registration form, indicating their willingness to reinstate the student. Reactivation may only take place within four months of the student’s annual registration month, and the student will be responsible for fees for the entire term. If the student wishes to return to program after the four-month period has passed, the student must apply for readmission for the next session to which the program will admit students (see A.7 Readmission).
### B.1 Registration

Each year of the program, no later than the deadline date for the annual registration month, each graduate student must register using the Student Centre, which is accessible through [https://my.ucalgary.ca](https://my.ucalgary.ca). Students enrolled in thesis-based Master’s or doctoral programs will be considered full-time.

A student who does not register by the appropriate deadline date will be withdrawn for failure to register.

A complete guide to registration is available online at [www.ucalgary.ca/registrar](http://www.ucalgary.ca/registrar). Please visit this Web site for detailed system instructions as well as up-to-date course registration information.

Students should always consult with their graduate programs concerning course selection. Refer to the deadlines in the Academic Schedule at the beginning of this Calendar.

An advisor or Supervisor must be appointed within one month of the start of a thesis-based program. Thesis-based students complete an annual progress report in May each year. Course-based students should consult their program administrator for program requirements.

Students wishing to audit courses must consult with their graduate program and complete a Change of Course Registration form.

Following registration, it is the student’s responsibility to verify course registration and fee assessment using the Student Centre. Questions regarding registration should be directed to the appropriate graduate program or the Faculty of Graduate Studies.

Students must maintain continuous registration and pay the appropriate fees until all degree requirements have been completed. A student who fails to re-register by the deadline indicated in the Academic Schedule will be withdrawn from the program for failure to register. Information about readmission or reactivation appears above.

Students in course-based programs must take a minimum of one half-course per registration year. If a student in a course-based program does not take a minimum of one half-course during a registration year, the student will be required to withdraw from program. It is expected that students in course-based programs will complete at least half of the required courses in the first two years of the program.

### B.2 Transfer Credit

Students currently registered in a graduate degree program at the University of Calgary may receive credit for courses taken at other recognized institutions.

Program and Faculty of Graduate Studies’ approval of these arrangements must be obtained before the courses begin.

Course-based programs: Transfer credit for courses may not exceed one third of the program or two full-course equivalents, whichever is less. Transfer credit and any advanced credit received upon entrance to the program may not exceed one third of the program or two full-course equivalents, whichever is less.

In order to receive transfer credit, students must arrange for official transcripts showing the courses taken and grades achieved to be sent from the other institution to the Faculty of Graduate Studies. Courses for which transfer credit is being sought must be from a recognized institution and not have been used for any degree or diploma accreditation. They must be graded, graduate level courses, and the graded level of performance must be equivalent to a “B” grade or higher standing at the University of Calgary. Transfer credit is not granted for courses for which the graded level of performance is equivalent to “B-” or lower.

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B.3 Student Status

B.3.a) Research (Thesis)-Based Programs

Students registered in Master’s Thesis and Doctoral Programs will be considered full-time unless their program formally offers a part-time option, by listing the option under their respective program listing in this calendar and approves the student for a part-time registration status.

It is understood that full-time students will normally work an average of 40 hours per week on program-related activities. Program-related activities include course work, systematic reading, laboratory or other research work related to the production of thesis proposals and/or defence of thesis and proposals, field work, and study for candidacy examinations.

A graduate student may arrange to undertake a portion of the full-time requirement at another institution or in the field. Requests for permission to undertake such full-time external student research must be submitted well in advance to the Graduate Program Director for approval.

B.3.b) Course-Based Programs

B.3.b.i. Course Work Minima

Course-based graduate programs normally consist of at least six full-course equivalents taken at the graduate level. Audited courses do not count towards the fulfillment of program requirements.

B.3.b.ii. Full-Time Students

Students will be considered full-time if they enrol in six or more half-course equivalents per annual registration.

B.3.b.iii. Part-Time Students

In order to remain eligible for part-time status, students may enrol in no more than five half-course equivalents per annual registration.

Enrolment in additional courses will require a change in status to full-time enrolment. A change from part-time to full-time status will require program approval indicating satisfactory progress for full-time registration. It will also require that students pay the full-time general fees for the full year retroactive to their anniversary registration date.

Only programs that stipulate a part-time enrolment option under their respective listing in this calendar may approve part-time enrolment requests.

B.3.c) Change of Registration or Status

Course changes must be done through the online Student Centre at myUofC and will be considered until the deadlines listed in the Academic Schedule of this Calendar.

Course changes after the registration deadline must be done on a Change of Course Registration form and a $60 late registration fee will be charged.

Registration to audit a course must be done on a Change of Course Registration form.

Changes to full-time/part-time status subsequent to the registration deadline must be submitted to the Faculty of Graduate Studies on a Change of Program or Status form. Forms are available on the Faculty of Graduate Studies website at: http://www.grad.ucalgary.ca/forms/registration.

B.4 Program Transfers

Program transfers must take place before a student’s third annual registration. Students should consult the supervisor and Graduate Program Director. Current time in program will be credited; course credit is given at the discretion of the program.

B.5 Withdrawals

B.5.a) Course Withdrawal

A graduate student may withdraw online from a course in which he/she is registered via My UofC, any time up to and including the deadline dates given in the Academic Schedule section of this Calendar. Students are not permitted to withdraw online more than once from the same course. Tuition fees will be refunded only if the student drops a course on or before the last day to drop courses for that term according to the Academic Schedule.

Note: all withdrawals after the registration deadline will be recorded on the student transcript.

B.5.b) Program Withdrawal

A student wishing to withdraw from the Faculty of Graduate Studies should complete a Graduate Withdrawal form, available at http://www.grad.ucalgary.ca/forms/withdrawal.

Fees for subsequent terms will be cancelled upon withdrawal notification.

A student in a course-based program who withdraws from a program without having taken a course during the year will not be refunded the tuition fee assessment of the equivalent to a graduate half-course fee for the registration year unless the student withdraws from program before the fee payment deadline in his/her annual registration month.

When a student withdraws from the Faculty of Graduate Studies, it is the student’s responsibility to ensure that all outstanding fees are paid.

After a required withdrawal from a graduate program at the University of Calgary, a student may not apply to another graduate program at the University of Calgary until a year after the final decision to require withdrawal has been made.

Students under academic review will not be permitted to withdraw during the review process.

B.6 Time Limits

Except where noted in the detailed program descriptions, students in thesis-based programs at the Master’s level must complete all degree requirements within four registration years.

Students in course-based Master’s programs must complete all degree requirements within six registration years.

It is expected that students completing a Master’s degree on a full-time basis will complete the degree within half the time allowed.

Students in doctoral programs must complete all degree requirements within six registration years, although it is expected that most candidates will complete requirements within four years.

B.6.a) Program Extensions

If a student needs longer than the regulation time allowed to complete a program, an extension to program may be granted on the basis of a recommendation from the Graduate Director that specifies the grounds for the extension and provides a detailed schedule for the completion of the program.

B.6.a) i. Program Extensions for GSA Executive Members

Graduate programs must take the service by GSA Executive members into consideration in assessing the student’s progress in the annual progress report. On request, the Faculty of Graduate Studies will grant GSA Executive members extensions to time in program of up to one year per year in office.

B.7 Leave of Absence

The Leave of Absence policy was created to assist graduate students who require a leave from their program. Such leaves are granted for reasons such as:

• Bereavement
• Care-giving responsibilities
• Maternity
• Medical requirements
• Military service
• Parental responsibilities
• Political service

Leaves of absence may be granted for a minimum of one term and up to one year. Such requested leaves must be approved by the student’s home graduate program. Proper documentation must be supplied when applicable (e.g., medical leaves).

The home program may grant requests for leaves of absence for a minimum of one term up to a maximum of one year; any requests for renewal beyond a year must
be approved by the Faculty of Graduate Studies. The total length of leave time with renewal must not exceed two (2) years for master’s, graduate certificates and graduate diploma’s students and three (3) years for doctoral students. During a leave of absence, students are not expected to work on their graduate programs. The time on leave will not count as time in program, i.e., a doctoral student who completes two years and then takes a one year leave of absence, will still have four years to complete degree requirements.

Application for a leave of absence should be made in advance of the anticipated leave, or as soon as possible after the event necessitating the leave occurs. While it is often difficult to anticipate the need for a leave, it is helpful if the beginning and end of the leave coincide with the beginning and end dates of a term. All supporting documents (e.g., medical notes) need to be submitted along with the request form. Although programs/ departments can grant leaves that do not exceed a total length of one year, all approved requests are required to be submitted to the Faculty of Graduate Studies for the purpose of record keeping.

During an approved leave of absence of up to one year, all Faculty of Graduate Studies (FGS) administered scholarship funding is deferred until the student returns to full-time registration. Students should be aware that supervisory and/or funding arrangements other than FGS-administered scholarships cannot in general be guaranteed on return from a leave. It is the student’s responsibility to ensure that the proposed leave is compatible with the regulations of any granting agency from which funding would normally be received during the leave period, and that such agencies are informed of the proposed leave. Students on student loan programs should clarify the consequences that a leave will have on their repayment status; information about education financing in Alberta can be found at http://www.alis.gov.ab.ca/ecfo/studentsfinance/students-finance.html.

International students should consult the International Student Centre and immigration authorities regarding their immigration status during the proposed leave.

**B.7 a) Leave of Absence Procedure: UPDATED**

The student should discuss the leave and its implications with the supervisor and any other appropriate people, e.g., members of the supervisory committee.

1. If it’s a first-time request, and the total length of the leave is less than one year, submit the completed and signed Application for Leave of Absence form to the student’s home graduate program for approval. (See http://www.grad.ucalgary.ca > Forms).

2. If the total length of the leave on the student’s record is beyond a year, any renewals must be approved by the Faculty of Graduate Studies. The completed and signed Application for Leave of Absence form must be forwarded to the Faculty of Graduate Studies for Approval.

**B.7 b) Maternity Leave**

In the case of a maternity leave which interrupts funding, the Faculty of Graduate Studies will provide funding for up to 4 months at the rate of $1,000 per month for those months in which no other funding is being received. Thus, if a mother is receiving 1 month of maternity leave paid under the GSA Collective Agreement, the Faculty of Graduate Studies will pay for 3 months. Submission of a Leave of Absence for maternity leave submitted as the reason for the leave will trigger a review by the Faculty of Graduate Studies of the student’s eligibility for these funds.

**C. 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 approved students may be registered simultaneously in two programs. The requirements for both degrees must be completed before the student can graduate. The University of Calgary presently offers the following combined degree programs: JD/MBA, MSW/MBA, MBT/MBA, MSc/MBA, PhD/MBA, MD/Master’s degree, and MD/PhD. Information and application packages are available from the relevant graduate programs.

**D. Interdisciplinary Degrees**

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 of reference to the proposed home program, which will liaise with the proposed conjoint program. Further details regarding the application process to an interdisciplinary degree program are available at http://www.grad.ucalgary.ca/policies/interdisciplinary

**E. Academic Standing**

**E.1 Distribution of Grades**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Point Value</th>
<th>Graduate Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.00</td>
<td>Outstanding</td>
</tr>
<tr>
<td>A</td>
<td>4.00</td>
<td>Excellent - superior performance showing comprehensive understanding of the subject matter.</td>
</tr>
<tr>
<td>A-</td>
<td>3.70</td>
<td>Very good performance</td>
</tr>
<tr>
<td>B+</td>
<td>3.30</td>
<td>Good performance</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
<td>Satisfactory performance</td>
</tr>
<tr>
<td>B-</td>
<td>2.70</td>
<td>Minimum pass for students in the Faculty of Graduate Studies.</td>
</tr>
</tbody>
</table>

**E.2 Student Standing UPDATED**

A student who receives a "C-" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

Thesis-based students in the Faculty of Graduate Studies, who do not maintain a GPA within the last 12 months of at least 3.00 at the May reviewing period will be required to withdraw from the program unless the program recommends otherwise.

Course-based students in the Faculty of Graduate Studies who do not maintain an annual GPA of at least 3.00 will be required to withdraw from the program unless the program recommends otherwise. The GPA for course-based students will be calculated each year at the time of their registration anniversary.

A student must have a cumulative GPA of at least 3.00 in order to graduate.

A graduate program may recommend to the Faculty of Graduate Studies that a student be required to withdraw for lack of satisfactory progress in either course work or research.

The Faculty of Graduate Studies, after consultation with the graduate program and/or supervisory committee concerned, may initiate the withdrawal of a student.

Final grades may be accessed through the Student Centre at https://my.ucalgary.ca/.

**F. Student Progress**

**UPDATE**

Annual Progress Report

Each thesis-based graduate student must file an annual progress report with his or her graduate program during the month of May every year. Delinquent students may be denied registration.

The annual progress report is accessed from the MyUofC Student Centre at: https://cas.ucalgary.ca/cas/?service=https://my.ucalgary.ca/uPortal2/Authentication.

**G. Examinations**

Please refer to the main University of Calgary Calendar for general examination regulations.

In addition to the University of Calgary examination regulations, each student must satisfy all examination requirements, as noted in the Faculty of Graduate Studies.
**Academic Regulations**

Handbook of Supervision and Examination section of this Calendar). The handbooks are also available on the Graduate Studies website at http://www.grad.ucalgary.ca/policies/exams.

**H. Language**

Except in certain courses in the language departments, the language of instruction at the University of Calgary is English. Theses must be submitted in English, except in the Department of Germanic, Slavic and East Asian Studies, the Department of French, Italian and Spanish, and in the French Education sub-specialization in the Graduate Division of Educational Research. There is no Faculty of Graduate Studies requirement for proficiency in any language other than English. Individual graduate programs, however, may have their own requirements as set out in the Programs of Study section in this Calendar.

**I. Supervisors/Advisors**

**I.1 Thesis-based Programs**

All students in thesis-based programs leading to graduate degrees are required to have a supervisor or an advisor. Students arriving on campus may be assigned an interim advisor until they have had an opportunity to become familiar with the Faculty members and their research interests, but must have a permanent supervisor or advisor no later than one year after initial registration. These students must have an approved supervisor prior to their second annual registration date. No student will be permitted a second annual registration without having an approved supervisor. See Faculty of Graduate Studies Handbook of Supervision and Examination in this calendar.

**I.2 Course-based Programs**

Although the Faculty of Graduate Studies does not require the formal appointment of a Supervisor in course-based programs, a Faculty Advisor or a Supervisor may be appointed by the program. Please see individual program listings for details.

**I.3 Conflict of Interest**

There is potential for conflict of interest when a student’s relationship with a supervisor, or with others who are in a position to influence academic decisions, is more than a strictly academic one. There may also be a conflict of interest with implications for a student’s program when a student is at the same time a research assistant, a lab mate or a student assistant. In order to avoid conflict of interest and protect privacy, graduate students are not permitted to evaluate other graduate students who are registered in the same program for the same degree.

**J. Research and Theses**

**J.1 Research and Ethics Approval**

All research involving human subjects, animals or biohazards must receive ethics clearance from the appropriate University of Calgary Research Ethics Board. There are two Conjoint Research Ethics Boards, the Conjoint Health Research Ethics Board for the Faculties of Kinesiology, Medicine and Nursing, and the Conjoint Faculties Research Ethics Board for all other Faculties. The appropriate department or Faculty ethics review committee first reviews research proposals involving human subjects. After the department or Faculty ethics review committee is satisfied, the proposal is sent to the appropriate Conjoint Research Ethics Board with a recommendation for approval. Graduate students should consult with their departments or graduate programs, and review the Research Ethics site at http://www.ucalgary.ca/research/compliance/ethics for information about the ethics approval process.

**J.2 Theses**

Complete information on the formatting, printing, binding and distribution of the thesis is contained in the Faculty of Graduate Studies Thesis Guidelines, available at http://www.grad.ucalgary.ca/policies/thesis. Once all the examiners have signed the approval pages, the student must submit one unbound copy of the thesis, the signed original approval page, a Departmental Clearance for Convocation for Thesis Students form that is appropriately signed, a Thesis Distribution Form and a University of Calgary Partial Copyright Licence form, to the Faculty of Graduate Studies. The Faculty of Graduate Studies will arrange to have the unbound thesis deposited in the University of Calgary Archives.

A second copy of the thesis, submitted in electronic format or as an unbound printed copy, with a Library and Archives Canada Subject Term Classification form and a Library and Archives Canada Non-Exclusive Licence to Reproduce Theses, will become part of the national thesis database and available from the Library and Archives Canada. (See the Thesis Guidelines for further information about the submission format.) The Faculty of Graduate Studies will arrange to have the thesis submitted to the Library and Archives Canada.

Note: Copies of the thesis approval or ethics approval pages with signatures should not be included in submissions to the Library and Archives Canada.

The student may decide not to have a copy of the thesis submitted to the Library and Archives Canada. This decision must be made when the thesis is submitted to the Faculty of Graduate Studies. The Faculty of Graduate Studies will not be responsible for later submission of the thesis to the Library and Archives Canada.

The student is responsible for the costs of printing and binding the required number of copies of the thesis, and for having the required number of copies bound. Students must continue to pay the appropriate tuition and general fees until all degree requirements, including the submission of the thesis to the Faculty of Graduate Studies, have been completed.

**K. Graduation**

The various deadline dates pertaining to Convocation are set out in the Academic Schedule. Students are strongly advised to acquaint themselves with these dates.

**K.1 Application for Degree**

Updated

All students who expect to receive degrees or diplomas at one of the Spring (May or June) or Fall Convocations must complete an online Application for Degree, available through the Student Centre via the Portal at https://my.ucalgary.ca. Students who do not complete an Application for Degree form will not be included in the graduation list. The deadlines for such applications are December 31 for Winter graduation, February 1 for Spring (May and June) Convocations and August 15 for Fall Convocation.

**K.2 Convocation Requirements**

In order to be cleared to graduate, thesis-based students must successfully pass a final thesis oral examination, submit an unbound copy of the thesis, a University of Calgary Partial Copyright Licence, and a Department Recommendation for Convocation Clearance form to the Faculty of Graduate Studies, and fulfill graduate program requirements for the submission of thesis copies.

If a student has not been cleared to graduate before the student’s next annual registration date, the student must register. If the student does not register, the student will be withdrawn for failure to register. When the student subsequently applies for re-admission to graduate, the student will be assessed fees retroactive to the date of withdrawal.

**L. Appeals**

The University recognizes that there are instances when a student may wish to challenge University decisions about grades or academic policy. When a dispute arises, every effort should be made to resolve the issues informally rather than resort to a formal appeal. If, however, a formal appeal is necessary, the student should follow the Appeals Procedures that are described below.

Appeals for reappraisal of graded term work, reappraisal of final grades, and other academic appeals are pursued through the teaching Faculty. The Faculty of Graduate Studies Appeals Committee hears appeals against rulings by the Dean of Graduate Studies, or designate.
The following general guidelines define the routes of appeal in different areas:

General Principles

1. Reappraisals of term and final grades occur at the department/Faculty level that originated those decisions, e.g., within the teaching Faculty.
2. Appeals of grade/Faculty level other such academic decisions will be first handled at the level of appeal closest to the level at which the decision was made.
3. Appeals against Faculty of Graduate Studies decisions or regulations will be handled through the Faculty of Graduate Studies.
4. Students must begin the reappraisal/appeal process at the appropriate level and proceed through successive levels of appeal in order, and with no omissions.
5. 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.
6. The General Faculties Council’s Committee to Hear and Determine Student Academic Appeals will hear an appeal only if there is a credible allegation of: (a) bias, or (b) unfair procedures at a lower level of appeal, or (c) substantial new evidence which could not have been presented at an earlier stage.
7. Students may obtain help in understanding the appeals process and in writing appeal letters from the Graduate Students’ Association.

L.1 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 appropriate associate/assistant Dean 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.

L.1.a) Teaching 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 unfavorable 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 that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

At this stage the Dean of the Faculty offering the course, at his or her 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 teaching 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.

L.1.b) Reappraisal of a 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 of the course, a part of the session; 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 Request for Reappraisal of Final Grade form from the Registrar’s Office. 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 and where the error can be found. 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 Session - March 1, Winter Session - June 30, Spring Session - August 15, Summer Session - October 15.

The reappraisal form shall be sent/brought to the Registrar who shall forward it to the appropriate associate/Faculty office. The Chair of the Faculty Appeals Committee, and the appellant as quickly as possible.

L.2 Appeals Against Faculty of Graduate Studies Rulings

Faculty of Graduate Studies Appeals Committee

If a student wishes to appeal a Faculty of Graduate Studies ruling (e.g., the requirement to withdraw for academic reasons, denial of continued registration, 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 Chair of the Graduate Studies Appeals Committee within fifteen days of the unfavorable 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.

The procedures for appeals to the Faculty of Graduate Studies Appeals Committee are the same for a final grade as for a piece of graded term work.

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. 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, in writing, its decision to uphold or deny the appeal, to the Dean of Graduate Studies and the appellant as quickly as possible.

Please see the Faculty of Graduate Studies website for additional details on the procedures for appeals to the Faculty of Graduate Studies Appeals Committee: http://www.grad.ucalgary.ca/policies/appeals.
L.3. General Faculties Council’s Committee to Hear and Determine Student Academic Appeals

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

L.3.a) General Faculties Council’s Committee to Hear and Determine Student Academic Appeals

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 bias, unfair procedures, or if there is substantial new evidence that 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 Committee to Hear and Determine Student Academic Appeals must do so within fifteen days of the unfavourable decision from the Faculty Appeals Committee. A letter of appeal should be sent to the Secretary to General Faculties Council (Administration Building, Room 127), and must indicate the decision being appealed, the grounds for appeal (i.e., alleged bias, alleged unfair procedures, or substantial new information), and the remedies being sought by the student, together with all supporting documentation. The appeal letter should also state 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 advocate, how the hearing will be conducted and other information.

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.

L.4 Academic Appeals

1. The Appeals Process - In the case of an appeal of a grade, the appeal should be to the Appeals Committee of that Faculty offering the course. A student who is placed on probation, suspended, or expelled from the Faculty of Graduate Studies, may appeal that decision, or any other Faculty of Graduate Studies ruling, to the Faculty of Graduate Studies Appeals Committee. The appeal, which must be initiated within fifteen days of the receipt of the letter from the Dean or his/her 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.

2. Sufficient Grounds - 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 that 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, he/she 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 and assessed fees 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 stands.

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 his/her appeal is unsuccessful, the notation “suspended or expelled from or placed on disciplinary probation by the Faculty of Graduate Studies, 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 he or she was 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 he or she was 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, 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 “Fs.” 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 (see below).

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

It is expected that the procedures outlined above will be sufficient to deal with any student appeal. Students should note however, that the current University Act, Section 45(2) states: “Subsection (1) does not take away or impair the right of any student or group of students to petition any of the governing bodies of the University in respect of any matter, but such petition shall be in writing and shall be transmitted to the governing body through the president of the university.”

The Board of Governors has approved principles and procedures to guide its Petitions Committee in considering student petitions. However, the Board of Governors recognizes that the General Faculties Council is the final body of appeal with respect to academic matters including, but not limited to, grades,
examinations, refusal of continued registration, or the requirement to withdraw from the University for academic reasons. The Petitions Committee will not attempt to evaluate the merits of any course or program grade, or of any other decision relating to an academic matter. The Board of Governors and the Petitions Committee of the Board of Governors do not have any jurisdiction to determine petitions received from students pursuant to sections 45(2) and 42(1)(a) of the Universities Act, where the petitions are in relation to courses offered and marked at an educational institution other than the University of Calgary, notwithstanding that the course may be credited toward a University of Calgary degree program.

A petition to the Board of Governors must be directed in writing to the President. The nature of the petition and the remedies sought by the petitioner(s) shall be clearly stated in a letter, and all supporting evidence or background materials included. If the Petitions Committee finds that the case has merit, the matter may be returned directly to the appropriate jurisdiction for a rehearing. In the case of substantially academic matters, referral will be to General Faculties Council for its determination as to the appropriate level of jurisdiction. The Petitions Committee may allow a hearing if it accepts jurisdiction in the matter and deems the facts to warrant such a hearing.

The Petitions Committee will not hear a petition for any remedy that may be obtained through existing appeal procedures within the University before those appeal procedures have been fully utilized, nor will academic decisions be set aside on the basis of minor irregularities in procedure.

In the case of a petition challenging a decision of the University body on procedural grounds such as breaches of natural justice or fairness, the Petitions 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 a petition challenging a decision in which the student is denied permission to register, the student shall not be registered while the petition is before the Board.

For more specific information on the principles and procedures governing student petitions to the Board of Governors, the Secretary to the Board of Governors should be consulted.

L.6 Continued Registration While Under Appeal
Students who appeal academic decisions to the teaching Faculty Appeals Committee or the General Faculties Council’s Committee to Hear and Determine Student Academic Appeals have the right to continue their registration and to attend classes during the appeal process. The student is required to pay all fees. If the appeal fails, the student’s registration will be cancelled, regardless of the date, and all fees refunded in full. Students petitioning the Board of Governors are not permitted to register while under petition.

M. Statement of Intellectual Honesty
Intellectual honesty is the cornerstone of the development and acquisition of knowledge. Knowledge is cumulative and advances are predicated on the contributions of others. In the normal course of scholarship these contributions are apprehended, critically evaluated, and form 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 his/her 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.

N. Statement on Principles of Conduct

N.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 premises, 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.

N.2 Statement
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

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

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:

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

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

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.

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

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).

O. Student Misconduct

A single offence of cheating, plagiarism, or other academic misconduct, on academic work may lead to disciplinary probation or a student’s suspension or expulsion from the Faculty if it is determined that the offence warrants such action.

O.1. Plagiarism/Cheating/Other Academic Misconduct

O.1.a) 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 present-
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Academic Regulations is registered in a Faculty other than that in
which the course is given, this is the only penalty that shall be applied by the host
Faculty. A student may not avoid a failing grade by withdrawing from the course.

1. Disciplinary Probation - When a student is placed on disciplinary probation, he or she
is 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 he or she
is 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 his or her probationary period. This penalty shall be applied by the Faculty
in which the student is registered at the time of the offence.

2. 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 regis-
tration 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 his/her eligibility for readmission. This penalty shall be applied by the
Faculty in which the student is registered at the time of the offence.

3. 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.

4. Disciplinary Probation - When a student is
denied the right to pursue an academic program, he or she
is entitled to continue the examination
provided that he or she
may apply for inclusion in the Faculty in the normal way after the satisfactory
completion of the probationary period. 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 recom-
mandation may be made to the Vice-President (Academic), who may act to expel the
student from the University.

O.1.b) 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 com-
mitted, 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.

O.2 Procedures

1. Identification of Students in Examinations - Invigilators of all 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 Citizen-
ship 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 his/her delegate.

A student who is not able to provide acceptable proof of identity may be permitted to continue the examination provided that he or she undertakes to provide verification of identity later. If verification is not provided, then the student will receive an "F" in the exam-
ation, and the matter will be referred to the Dean of the Faculty in which the course is offered or his/her delegate for consider-
ation of further disciplinary action.

2. The Responsibility of Instructors in Cases of Plagiarism, Cheating and Other Academic Misconduct - An instructor has the obliga-
tion to report immediately all suspected cases of plagiarism, cheating or other academic misconduct in his/her course or courses to the Dean of his/her Faculty, or his/her delegate, and to his/her 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 his/her delegate. An individual or group of individu-
als 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, his/her delegate, the appropriate Faculty disciplinary body, the Faculty Ap-
peals 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 his/her 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.
Q. Non-Academic Misconduct Policy

Purpose
1. The goal of this policy is to provide a clear and transparent process for managing and addressing non-academic misconduct and to do so in a manner that is centralized and follows the principles of natural justice. The primary objective is to ensure that appropriate Student behaviour is maintained in a diverse educational environment.

Scope
2. The Policy applies to unacceptable conduct of any Student (all undergraduate and graduate students as well as postgraduate students in the Faculty of Medicine) while on the University of Calgary premises or when acting as a Representative of the University at off-campus venues and events. This Policy also applies to University of Calgary Students studying abroad at other campuses, or attending a satellite location of the University (e.g., Downtown Campus). In addition, the University reserves the right to take necessary and appropriate action to protect the safety and security of the campus community, including taking necessary and appropriate action in cases when a Student is accused of serious conduct, and there is a clear connection to the University of Calgary regardless of where the conduct occurred or is alleged to have occurred. Students are expected to be individually responsible for their conduct. Any Student found responsible for violations of the Policy will be subject to disciplinary actions as outlined in the Policy, regardless of how the incident is dealt with by other policies or law(s).

Definitions
3. In this policy:
   a) “Advisor” is a person who attends a Hearing with a Student to act as a support person to him/her during the Hearing. An Advisor includes, but is not limited to, the University Ombudsperson, the SU Student Rights Advisor, a peer, a representative of the Students’ Union or Graduate Students’ Association, or a Student and Enrolment Services Peer Helper.
   b) “Appeal Board” is the final committee to which Students may appeal decisions made pursuant to this policy. The Board consists of five members: one faculty member, one staff member, one Student, a vice-chairperson and a chairperson. The Board is chaired by the Vice-Provost (Students). Appeal Hearings through the Appeal Board are arranged through the Office of the Vice-Provost (Students).
   c) “Associate Vice-Provost (Student Success and Learning Support Services)” is the person who will receive, review and hear allegations of misconduct and make determinations and/or recommendations under this policy. An appointed and approved delegate of the Associate Vice-Provost (Student Success and Learning Support Services) may also serve to receive, review and hear allegations of misconduct and make determinations and/or recommendations under this policy.
   d) “Guest” is a person invited on to campus by a registered Student.
   e) “Hearing” is the adjudication process carried out to resolve a potential violation of the Policy.
   f) “Representative of the University” means a registered Student who is participating in a University-related function or event and is doing so in his/her capacity as a University of Calgary Student. A Student who is participating in a field trip, off-campus volunteer or service-learning initiative or special event hosted by the University is considered to be acting as a Representative of the University.
   g) “Student” is a person who is registered in any course of study.
   h) “Students-at-Risk” means any Student whose physical or mental state is such that they may be or have become a threat to themselves, others, the educational process, or the University of Calgary community in general.
   i) “Students-at-Risk Evaluation Team” serves as an emergency support committee that responds to Students-at-Risk and makes decisions related to situations involving Students-at-Risk.
   j) “Student Groups” are recognized Student Groups and/or groups of Student volunteers and/or groups of University Students who publicly affiliate with one another for a specific rationale or cause.
   k) “Student Host” means a person who is hosting a Guest on University premises.
   l) “University” refers to the University of Calgary, and includes buildings and lands owned, leased, operated, controlled or supervised by the University.

Policy Statement

4 Preamble
1. The University of Calgary comprises a community of Students, faculty and staff who are dedicated to furthering learning, intellectual inquiry and personal and professional development. Our community is one of education, work and living. Membership in this community implies all members act with personal integrity and in harmony with the educational goals of the institution.

4.2 The Non-Academic Misconduct Policy exists to promote the safety and security of all members of the University of Calgary community. The University views the non-academic misconduct process as a learning experience which results in personal understanding of one’s responsibilities and rights within the University environment. To this end, the Student conduct process attempts to balance an understanding and knowledge of Students and their needs and rights with the expectations of the University and larger community. All members of the University community share responsibility for ensuring a safe and secure environment and...
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the University will take reasonable steps to ensure that all members of the community are aware of their rights and responsibilities.

4.3 In consultation with faculty, staff and Student representatives, the University has developed the following Non-Academic Misconduct Policy to ensure the safety and security of the educational, living and work environment of Students and all members of the University of Calgary community.

Any actions taken by Students to directly or indirectly jeopardize the orderly functioning of the institution will be handled through the policy articulated below.

Principles

4.4 The principles of this policy recognize that each member of our community has an obligation to treat one another with mutual respect. This policy reflects the contributions of all constituencies of the University of Calgary community. This policy is bound by the principles of procedural fairness and natural justice. Allegations of violations of this policy will be dealt with through clear communication that the behaviour is prohibited, notice of all allegations, reasons for sanctions, notice of procedures, the opportunity to be heard, notice of rationale for any decision, and the right to appeal within a clearly defined appeal structure.

Violations

4.5 The University of Calgary expects Students to maintain standards of personal integrity that are in harmony with the educational goals of the institution and to assume responsibility for their actions; to observe the law and University regulations; and to respect the rights, privileges, and property of others.

4.6 Nonacademic misconduct includes the actions set out in 4.9 and 4.10, any of which constitutes a violation under this Policy and which are therefore subject to the sanctions outlined.

4.7 Student Hosts are responsible for the actions of their Guests while on University premises and will be dealt with under this policy for the misconduct of their Guests.

Minor Violations

4.8 Depending on the specifics of the situation and upon review of the facts, a minor violation may be moved to a major violation.

4.9 Minor violations are unacceptable actions by a University of Calgary Student or Student group that include, but are not limited to:

a) excessive noise;

b) engaging in communication toward an individual or group which may be considered harassing or offensive (including online communication);

c) engaging in disruptive behaviour. Disruptive behaviour is that which disrupts or invades the rights of others;

d) damage or destruction of property (under $500.00);

e) misuse of library or computer resources;

f) any unauthorized entry or presence in a University building or on University grounds;

g) abusing or hindering the non-academic misconduct process;

h) failure to complete a sanction for a violation of the Policy.

Major Violations

4.10 Major Violations are actions by a University of Calgary Student or Student group which endanger the safety and/or security of another individual or the University of Calgary community, or that contravene municipal, provincial or federal law. Major violations include, but are not limited to:

a) contravening the Alberta Gaming and Liquor Act and/or the University Alcohol Policy;

b) possessing, using, exchanging, manufacturing or selling illegal drugs;

possessing, storing, using or misusing any firearm, weapon, hazardous material or explosive substance;

d) damage or destruction of property (over $500.00);

e) failure to comply with the direction of a Campus Security Officer or University official in the legitimate pursuit of his/her duties;

f) hazing;

g) sexual assault or sexual misconduct;

h) fraud, including misuse of Student ID card or furnishing false information;

i) vandalism, tampering, defacing or damaging property that is not one’s own;

j) stealing or possessing property that is not one’s own without permission of the owner;

k) engaging in disruptive behaviour that involves substantial disorder and/or disruption to the operation of the University;

l) engaging in physical actions which may be considered to endanger the safety of, be considered intimidating by, and/or be considered physically abusive by the victim;

m) engaging in intimidating, threatening and/or offensive verbal or non-verbal behaviour or communication toward an individual or group;

n) tampering with fire and/or emergency equipment;

o) setting unauthorized fire(s);

p) unauthorized use of University facilities and/or equipment;

q) trespassing or attempting to fraudulently gain entry on University property;

r) publicly displaying and/or making pornographic material available anywhere on the University campus;

s) failing to follow prescribed risk management procedures;

Procedures

Residence Violation Procedures

4.11 Any breaches of the Residence Services Agreement are handled by the Department of Residence, Food and Conference Services in accordance with its disciplinary procedures and sanctions. Conduct which is deemed in violation of the Residence Services Agreement may also be referred to this non-academic misconduct process by the Director of Residence, Food and Conference Services. This may result in additional outcomes for the Student.

General Provisions

Any Student reported for alleged non-academic misconduct is subject to formal procedures under this policy regardless of concurrent action or inaction of civil or criminal authorities.

4.12 Where there are questions about the application of this policy and/or related policies, they shall be determined by the Associate Vice-Provost (Student Success and Learning Support Services) in consultation with the administrators of the other policies. Where there is a conflict between two policies, or between sanctions under this policy and another University policy with respect to student non-academic misconduct, this policy and its sanctions will take precedence.

4.13 Where a Student’s conduct violates this policy and gives rise to a complaint of academic misconduct, the Student may be subject to penalties under both or either policy.

4.14 Any member of the University of Calgary community may file a complaint concerning a violation under this policy with the Office of the Associate Vice-Provost (Student Success and Learning Support Services) within three (3) working days of the incident in question. This time period for filing notice of an alleged violation may be extended at the discretion of the Associate Vice-Provost (Student Success and Learning Support Services).

4.15 A Student who is subject to this policy because a complaint has been filed against him/her is encouraged to seek advice from an Advisor in all matters related to non-academic misconduct, and may be accompanied by an Advisor to any Hearing related to non-academic misconduct. Except in exceptional circumstances which would be so defined by the Associate Vice-Provost (Student Success and Learning Support Services), a Student may not bring a parent or guardian as an Advisor to a Hearing. In addition, as the process for handling non-academic misconduct is an administrative process and is not a criminal process, Advisors may not include legal counsel except when a student is charged with a criminal offense arising from the same incident.

4.16 Every Student who has allegedly been involved in non-academic misconduct and invited to a Hearing shall be provided with, in writing:

a) a proposed date of the Hearing, including notice of the right to reschedule the Hearing within reasonable time frames;

b) a notice of the alleged violation(s), including designation of violation(s) as major or minor violation(s);

c) a summary of pertinent evidence and particulars regarding the alleged violation...
(which may include summaries of Campus Security reports);
d) a copy of or access to this Policy, as well as specific copies of or access to other policies which are being invoked in addressing the non-academic misconduct alleged.

Procedures for Addressing Minor Violations

4.17 A minor violation may be dealt with by the official/designate within the area or department where it occurs and the appropriate sanction as set out in this policy may be applied.

4.18 A minor Violation may also be referred to the Associate Vice-Provost (Student Success and Learning Support Services) when the University official/designate believes:

a) satisfactory resolution of minor allegations and sanctions cannot be achieved between the Student and the University official; or,

b) the same minor Violation has been repeated by the Student, or there is a pattern of disruptive conduct;

c) the action of the Student has resulted in a monetary loss to the department which must be recovered through a restitution process.

4.19 The Associate Vice-Provost (Student Success and Learning Support Services) may:

a) dismiss the matter and provide written notification to the referring official/designate and the Student of the decision within ten (10) working days; or

b) arrange a Hearing with the Student and, if satisfied that the violation has been committed, impose any of the sanctions listed below (including a recommendation for suspension, expulsion or exceptional sanction). The Student may arrange to have an Advisor attend the Hearing.

4.20 Where the Student decides not to appear at a scheduled Hearing, a decision will be made in the absence of the Student based on available information.

4.21 If the Associate Vice-Provost (Student Success and Learning Support Services) determines that the issue will be dismissed without Hearing, every effort will be made to first discuss the matter with the complainant prior to informing the Student of the dismissal. If necessary, an opinion from University Legal Services will be sought.

4.22 All decisions will be communicated in writing to the Student and the referring University official/designate, within five (5) working days.

4.23 Timeframes indicated in 4.25, 4.26, and 4.29 are subject to extension only as the result of exceptional circumstances, such as absence from the office.

Sanctions

4.30 Sanctions may be applied independently or in combination for any single violation of this policy. Sanctions are intended to be corrective rather than punitive. Repeated and/or multiple violations of the policy will likely result in increased sanctions and/or severity of sanctions.

a) Written Warning: this warning will outline the details of the violation and warn the Student that repeated violations will result in more severe sanctions. This warning will be kept in the Student's conduct file and a copy may be sent to the original complainant. Note that there may be instances wherein confidentiality does not allow details to be revealed to the complainant.

b) Educational Sanction: participation in educational workshops, written assignments, personal reflection paper, restorative justice process or service to the University community.

c) Restitution to the University or to the affected individual or group of individuals if monetary loss has occurred as a result of the violation.

d) Behavioural contract: This set of conditions will be developed with the Student and signed by the Associate Vice-Provost (Student Success and Learning Support Services) or the Vice-Provost (Students) and the Student. Any breach of conditions as outlined in the behavioural contract may result in additional sanctions, including suspension or expulsion from the University.

e) Fine for non-compliance: In the event that a sanction is assigned and the Student does not complete the sanction, a fine will be assigned for non-compliance. Fines for non-compliance will not exceed $125.00 (Note that one representative from each of the Students’ Union and Graduate Students’ Association will determine an appropriate fund to allocate funds collected through fines).

f) Loss of privileges: loss of privileges for a defined period of time. This may include but is not limited to library, athletic, or parking privileges.

g) Probation: Placed on probation for a specified period of time and/or until imposed conditions are met. Failure to comply with conditions specified in probationary agreement could result in additional sanctions, including but not limited to suspension or expulsion.

h) Notice of Trespass: This sanction will be assigned for major violations and denies the individual the ability to enter the University campus entirely, or the ability to enter specific buildings on the University campus, or the ability to enter the University campus at specific times (e.g. after 5:00 pm and prior to 8:00 am). Individuals violating a notice of trespass may be charged by the Calgary Police Service.

i) Suspension: Loss of all academic privileges at the University for a specified period of time and/or until imposed conditions are met (i.e. completion of conditions as outlined in Behavioural Contract). A suspension for violation of the non-academic misconduct policy will be noted on a Student's academic transcript.

j) Expulsion: Loss of all academic privileges for an unspecified period of time. An expulsion for violation of the Non-Academic Misconduct Policy will be noted on a Student’s academic transcript.

University Temporary Suspension and Trespass Sanctions

4.31 The University reserves the right to bypass general non-academic misconduct procedures where immediate action is required because:

a) a Student’s behaviour affects other members of the community’s use and enjoyment of University privileges and facilities
b) there are reasonable grounds to believe that the safety of the community is endangered
c) there is a high potential of physical danger posed by the Student’s continued presence
d) damage to University property is likely
e) the continued presence of the Student would be disruptive.

4.32 Pending convening of a Hearing, the Vice-Provost (Students) or the President may apply a temporary University-wide suspension and trespass sanction. In cases where there is a real and present danger or high potential to cause harm posed by a Student, and the President and/or the Vice-Provost (Students) are not immediately available, the Associate Vice Provost (Student Success and Learning Support
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Services), or the Director of the Department of Campus Security may impose a notice of trespass sanction whereby the Student may be excluded from the University.

4.33 Pending convening of a Hearing in residence, and in cases where there is a real and present danger or high potential to cause harm posed by a Student in residence, the Director of Residence, Food and Conference Services may impose a temporary suspension and trespass sanction whereby the Student may be excluded from the residence complex and/or any campus dining facility. The Director will provide a full report to the Vice-Provost (Students) and Associate Vice-Provost (Student Success and Learning Support Services) without delay.

4.34 Upon imposition of such temporary sanction, the Student will be excluded from campus or residence, for as long as reasonably required, in the judgment of the President, the Vice-Provost (Students), the Associate Vice-Provost (Student Success and Learning Support Services), the Director of Campus Security, or the Director of Residence, Food and Conference Services. The date of return to the University campus will be conveyed to the Student as soon as possible following the incident. Normally such notice will be provided recognizing that legal, criminal or medical interventions may restrict the University’s ability to do so.

4.35 A formal notification of Hearing will be delivered within five (5) working days of the incident. On the date/time of the Hearing, the Student, having received proper notice of the meeting to be held regarding the incident, may only enter the University campus as authorized to attend that meeting on that day. In certain circumstances, special arrangements may be made for the Student to report to the Department of Campus Security upon arrival on campus and to be escorted to the meeting.

Internal Process and Criminal and Civil Actions

4.36 In most circumstances, the University will endeavour to deal with Student misconduct under this policy rather than pursuing remedy through criminal proceedings. In cases where there is real and present danger or a high potential of harm posed by the Student, Campus Security or other University officials may contact Calgary Police Service to respond to an incident. In this case, a full report of the incident will be forwarded to the Vice-Provost (Students) and the Associate Vice-Provost (Student Success and Learning Support Services).

4.37 Nothing in this policy prevents any member of the University community from proceeding with criminal or civil actions independent of any University action.

4.38 The timeframe indicated in 4.36 is subject to extension only as the result of exceptional circumstances, such as absence from the office.

Appeals

4.39 Students may appeal a decision made pursuant to this policy in writing within five (5) working days of receiving a decision. The appeal must contain a copy of the decision, a full statement of grounds for appeal, the outcome sought and any supporting documentation.

4.40 The grounds for appeal are one or more of the following:

• relevant evidence that emerges which was not available at the time of the original decision; or

• there was clear evidence of bias in the Hearing or original decision; or

• the non-academic misconduct procedures were not followed and the outcome of the case might have been substantially affected by this failure; or

• the severity of the sanction imposed exceeds the nature of the violation for reasons identified by the appellant.

NOTE: dissatisfaction with the sanction imposed does not constitute grounds for an appeal.

4.41 The appeal hearing officer or Appeal Board determines whether grounds for appeal will be accepted. If grounds for appeal are accepted, appeals shall be heard as follows:

a) An official/designate within a department who serves as a Hearing officer under this policy may have his/her decision appealed to the Associate Vice-Provost (Student Success and Learning Support Services).

b) The Associate Vice-Provost (Student Success and Learning Support Services) may have his/her decision appealed to the Vice-Provost (Students) or to the Appeal Board. The Student may choose his/her appeal body.

4.42 The body considering the appeal may, after reviewing the case:

a) Uphold the finding and/or sanction(s)

b) Reverse the decision.

c) Reverse only the sanction(s) and/or modify sanction(s), including increasing severity of initial sanction(s) assigned.

d) Determine a procedural error occurred and request that the original Hearing officer re-hear the case.

4.43 The decision will be relayed to the Student in writing within five (5) working days of the Hearing, unless the decision can be made at the time of the Hearing.

4.44 The decision of the appeal Hearing officer or Appeal Board is final, subject to a Student’s right to appeal to the Student Discipline Appeal Committee of the Board of Governors. Note that only the sanctions of suspension, expulsion or monetary fine may be appealed to the Student Discipline Appeal Committee of the Board of Governors as set out in the Post Secondary Learning Act.

4.45 Timeframes indicated in 4.40 and 4.44 are subject to extension only as the result of exceptional circumstances, such as absence from the office.

Students-at-Risk

4.46 In addition to dealing with non-academic misconduct, the University has a right and responsibility to address the conduct of a Student-at-Risk in order to protect that Student and/or members of the University community from any threat posed by their conduct. The University will always seek to balance the rights of the Student-at-Risk with the rights of members of the University community when governing the conduct of a Student-at-Risk.

4.47 Addressing the conduct of a Student-at-Risk can pose unique challenges to the University wherein that Student has a disability or diagnosis that is contributing to the “at-risk” behaviour. The University acknowledges that it has a duty to accommodate a Student with a disability, in accordance with provincial law and University policy.

Accommodation of Students with disabilities should be made in accordance with the following principles: respect for dignity, individualized accommodation, inclusion and full participation. The Student has a corresponding responsibility to make full disclosure of his/her disability and to cooperate with the University in making appropriate accommodation for him/her, including advising University officials of the need for accommodation, cooperating with University officials in the accommodation process, and providing medical or other requested information relating to the disability and the required accommodation.

4.48 The following procedures may be invoked in addition to, or as an alternative to managing Student behaviour and conduct under the non-academic misconduct process.

Students-at-Risk Evaluation Team

4.49 The Students-at-Risk Evaluation Team will be used to provide a coordinated response and support to the Student-at-Risk. Protocol for dealing with Students-at-Risk may differ depending on the level of threat posed by the Student-at-Risk, and is described in the Process and Procedures for Responding to Students-at-Risk, as set out below.

Process and Procedures for Responding to Students-at-Risk

4.50 Observance of behaviour that suggests a Student is at risk should be reported to the Director of University Security. This report, along with any prior reports related to the Student and his/her conduct, will then be forwarded to the Associate Vice-Provost (Student Success and Learning Support Services).

4.51 Normally, within three (3) working days of receiving a report of a Student-at-Risk, the Associate Vice-Provost (Student Success and Learning Support Services) will call a meeting of the Students-at-Risk Evaluation Team to review the report and to make a determination of the level of risk.
order to address the immediate threat and the Student’s behaviour. Possible outcomes for Level 3 threat behaviour include but are not limited to: those outlined under Levels 1 and 2, and/or involuntary leave or withdrawal from the University.

4.60 Note that in certain circumstances, the ability to define the level of threat may be beyond the expertise of the Students-at-Risk Evaluation Team, or of the professional staff at the SU Wellness Centre. In this instance the Student may be required to undergo assessment with specialists independent of the University. The Associate Vice-Provost (Student Success and Learning Support Services) may impose a sanction of temporary trespass and suspension until such evaluation is completed.

Temporary Suspension Prior to Meeting

4.61 The Director of Campus Security, the University President or the Associate Vice-Provost (Student Success and Learning Support Services) may authorize a temporary suspension of a Student-at-Risk until a meeting can be arranged if they believe there is a risk of harm to self or others.

Involuntary Leave and Withdrawal

4.62 Involuntary leave is defined as involuntary physical removal from campus for a period of time specified by the Associate Vice-Provost (Student Success and Learning Support Services) or the Students-at-Risk Evaluation Team. Involuntary withdrawal includes involuntary physical removal from campus and academic withdrawal from the University. Involuntary withdrawal requires consultation with University Legal Services and approval from the University President. Involuntary withdrawal may last for one academic term or longer. Involuntary leave or withdrawal is not pursued as a punitive step, but may coincide with sanctions for Student misconduct.

Decision Notification

4.63 For those cases that are deemed a level one or two threat, decision notification will follow procedural timelines outlined in this policy.

4.64 If a Student is placed on involuntary leave or withdrawal, he/she shall be notified of that decision by the Associate Vice-Provost (Student Success and Learning Support Services), together with the terms and conditions associated with the involuntary leave or withdrawal. A copy of the letter will be included in the Student’s conduct record in the Office of the Associate Vice-Provost (Student Success and Learning Support Services). The Director of any University department with an interest in the decision will also be copied on the letter (as deemed necessary and appropriate). Where involuntary withdrawal is invoked, the Student-at-Risk will be prevented from re-enrolment for the duration of the involuntary withdrawal. In some cases, if the Student-at-Risk is receiving medical or psychological care from a member of the SU Wellness Centre, arrangements will be made to continue treatment for a defined period of time. Upon notification of involuntary leave or withdrawal, the Student-at-Risk releases the University from any responsibility of return to campus procedures.

Return to Campus Procedure for Involuntary Leave

4.65 Following an involuntary leave, the Student-at-Risk must apply in writing to the Associate Vice-Provost (Student Success and Learning Support Services), in order to return to campus. The application will require the following in order to be considered: evidence that all terms and conditions associated with the involuntary leave have been met, evidence that all current outstanding disciplinary sanctions have been completed, and, if applicable, an assessment and treatment plan, completed by appropriate treating medical professional(s). The Associate Vice-Provost (Student Success and Learning Support Services) will provide completed applications and accompanying documentation to the Students-at-Risk Evaluation Team to consider. During the review process, the Evaluation Team may require the Student to provide additional or more recent documentation from treating medical professional(s). If the application is approved, the Students-at-Risk evaluation team will develop a Return to Campus Management Plan. The Associate Vice-Provost (Student Success and Learning Support Services) shall review the Return to Campus Management Plan with the Student.

Return to Campus Procedure for Involuntary Withdrawal

4.66 Following an involuntary withdrawal, the Student-at-Risk must apply in writing to the Associate Vice-Provost (Student Success and Learning Support Services) in order to return to campus. The application is due no later than sixty (60) days before the Student’s anticipated return to campus. The application will require the following in order to be considered: evidence that all terms and conditions associated with the involuntary withdrawal have been met, evidence that all current outstanding disciplinary sanctions have been completed, and a treatment summary completed by appropriate treating medical professional(s). The Associate Vice-Provost (Student Success and Learning Support Services) will review the completed application and accompanying documentation and forward for the consideration of the Students-at-Risk Evaluation Team. During the review process, the Evaluation Team may require the Student to provide additional, more recent documentation from treating medical professional(s). If the application is approved, the Students-at-Risk Evaluation Team will develop a Return to Campus Management Plan. The Associate Vice-Provost (Student Success and Learning Support Services) shall inform the Student, in writing, as to whether the application has been approved and, if approved, shall review the Return to Campus Management Plan with the Student. This will normally be completed within thirty (30) days of the anticipated return to campus date.
Academic Regulations

Return to Campus Management Plan
4.67 Where a Student has received approval to return to campus following involuntary withdrawal, the Students-at-Risk Evaluation Team shall prepare a Return to Campus Management Plan that outlines any terms and conditions of the Student’s return to campus and any support services required. The Associate Vice-Provost (Student Success and Learning Support Services) for a period of up to five years after the Student graduates or ceases to be a Student. Reports and statistics compiled by the Associate Vice-Provost on the nature and number of cases and outcomes, including sanctions, will not include identification of individual Students. Records of charges that are dismissed will be sealed and kept for a period of one (1) year after the incident date and will be destroyed after one year. Records may be released as required by law.

Reporting
4.73 An annual report detailing types of cases heard and actions taken under this policy will be provided to the General Faculties Council.

5. Responsibilities

Appeal Board
Approval Authority –
• ensure appropriate rigour and due diligence in the development or revision of this policy.

Implementation Authority –
• ensure that University staff are aware of and understand the implications of this policy and related procedures;
• monitor compliance with the policy and related procedures;
• regularly review the policy and related procedures to ensure consistency in practice;
• sponsor the revision of this policy and related procedures when necessary.

Students-at-Risk Evaluation Team
6 Appendices
Appendix 1: Appeal Board Composition
Appendix 2: Students-at-Risk Evaluation Team Composition

7 Procedures
Appeal Board Procedures
Students-at-Risk Evaluation Team Procedures

8 History
Approved: February 4, 2010 (GFC 515.11)
Effective: February 4, 2010

Note: The electronic version is the official version of this policy. See: http://www.ucalgary.ca/policies/files/policies/Non-AcademicMisconduct%20Policy.pdf

R. 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 post-doctoral fellowships or their equivalent. The policy and procedures are titled Integrity in Scholarly Activity and apply to both teaching and research.

R.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.

R.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 that are applicable to those disciplines and activities that 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. In the Faculty of Graduate Studies, scholarly integrity applies to any scholarly activity undertaken in or identified with the University of Calgary.

S. 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.

S.1 Definition
The simple definition of sexual harassment is “unwanted sexual attention.” Any type of conduct that 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 behaviours 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, obscene 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 harass-
Academic Regulations

T. Policy 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, including AIDS, 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.

U. Vacation

Graduate students are entitled to two weeks of annual vacation. The two weeks of vacation do not include statutory holidays or days designated by the University as closed.

U.1 Vacation Time and Scholarships

Graduate students holding twelve month scholarships are entitled to two weeks of vacation during the twelve month period. The Two weeks of vacation do not interrupt the payment of the scholarship.

U.2 Vacation Time and Employment

In keeping with the Alberta Employment Standards Code and the Alberta Employment Standards Regulations, graduate students employed by the university or by a member of the academic staff at the university are entitled to two weeks of vacation time after twelve months of employment or prior to completing a full twelve months of employment if the employer agrees. In the case of graduate student employees who have already received payment in lieu of vacation (for example, as a graduate assistant / teaching / non-teaching), the time off will be without pay.

S.2 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 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 237-5888 or the Calgary Police at 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 affect 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 revised and updated. Persons seeking information on this issue are therefore encouraged to contact the Sexual Harassment Advisor to obtain a copy of the latest official document. The Advisor is located in MacEwan Student Centre, University Counselling Services, Room 375 and may be reached by telephone at 220-4086.

Additional information is available on the web at www.ucalgary.ca/sexualharassment.
Preamble
This handbook contains the rules, guidelines and procedures of the Faculty of Graduate Studies that pertain to the administration of graduate programs and to the appointment of graduate supervisors. While the rules are stated in fixed or absolute terms, it is intended that they be administered with some degree of flexibility and, to that end, the Dean of Graduate Studies and his/her designates are empowered to grant exceptions, extensions and variances, upon written request and explanation. Requests, whether from students or faculty members, should be made over the signature of the Graduate Coordinator of the program concerned.

The Head of a Department, Director of an interdisciplinary program or, in the case of non-departmentalized faculties, the Dean of the Faculty, is responsible for graduate programs. However, this responsibility is normally delegated to a Graduate Coordinator. In this document, for the sake of clarity in describing common practice, the Graduate Coordinator is referred to as the person responsible for the graduate program.

Please note that in this document “the Dean” refers to the Dean of Graduate Studies unless otherwise noted. The Handbook of Supervision and Examination is published as part of the Graduate Calendar. Changes made to the regulations during the year are indicated in the official online Calendar.

Part I: Course-based Master’s Degree
Approved by Graduate Council November 9, 2009

1. Supervision
Although the Faculty of Graduate Studies does not require the formal appointment of a Supervisor, programs may appoint a Faculty Advisor or a Supervisor. The latter must meet Faculty of Graduate Studies requirements for graduate supervision. Those requirements are outlined in Supervisory Policy http://grad.ucalgary.ca/policies/supervision.

2. Judgement of Student Performance
If a student’s grades do not meet the Calendar requirements (see Calendar, Student Standing), the Faculty of Graduate Studies will notify the program of this. In addition, the program may independently judge that a student’s performance is not satisfactory. In either case, it is the responsibility of the Graduate Coordinator to promptly notify the student in writing that performance is below an acceptable level. A student will be required to withdraw from the Faculty of Graduate Studies for reasons of unsatisfactory performance unless the program recommends otherwise.

3. Research Component and Exit Requirements
The Campus Alberta Quality Council requires a research component for all Course-based Master’s programs, and states that this requirement can be satisfied in a variety of ways, for example, by “one or more research courses in the program,” or a capstone course that focuses “on the integration and application of the knowledge acquired.” The programs may also “culminate in a comprehensive examination involving an examination committee.”[1] The Faculty of Graduate Studies operates in accordance with CAQC guidelines, and requires that the nature of the research component and the form of any comprehensive examination must be identified in program regulations that are approved by the Faculty of Graduate Studies Academic Program Committee.

4. Transfers
4.1 Transfer’s at the Masters Level
Application for Change of Area of Specialization
A student requires approval of both the Graduate Coordinator and the Dean of the Faculty of Graduate Studies to transfer from one area of specialization to another, while remaining within the degree program.

4.2 Transfers from Course-based Master’s Degree to Thesis-based Master’s Degree
A student requires approval of both the Graduate Coordinator and the Dean of the Faculty of Graduate Studies to transfer from a Course-based Master’s Degree to a Thesis-based Master’s Degree.

4.3 Transfers to Doctoral Programs
4.3.1 Transfer from Master’s to Doctoral Programs
Program Heads may recommend outstanding Master’s students for transfer to the doctoral program. Such recommendations must be endorsed by the proposed doctoral Supervisor and accompanied by the names of members of the proposed doctoral supervisory committee. The transfer must be approved by the Dean of Graduate Studies.

4.3.2 Course and Examination Requirements
Courses credited in the prior Master’s program will be taken as fulfilling doctoral requirements where applicable, in accordance with program requirements for required doctoral course work. All students transferring from Master’s to doctoral programs will be required to sit the doctoral candidacy examination.

Part II: Thesis-based Master’s Degree
Approved by Graduate Council April 2, 2009

Supervisors and Supervisory Committees
1.0 Selection of a Supervisor
1.1 General Advice to Students
All students must have either an interim advisor or an approved Supervisor at the time of first registration, and a permanent Supervisor no later than the second annual registration. It would help the student in program planning if the selection of a Supervisor were completed as quickly as possible. Students are encouraged to think about and select their areas of specialization as early as possible, and preferably before beginning the program.

1.2 Supervisor Selection
The initial selection of a Supervisor should be by mutual agreement between student and faculty member, and approved by the Graduate Coordinator. Difficulties or conflicts in selecting or recommending a Supervisor should be referred promptly to the Dean by any of the persons involved.
1.2.1 Supervisor Eligibility Requirements

Continuity of supervision throughout a graduate program is important to a student’s success. Normally, faculty members with Continuing Board appointments in the professorial ranks are chosen as Supervisors. However, there are occasions when it is to the student’s advantage for a program to recommend the appointment of a Supervisor who does not have a Continuing Board appointment. For example, an individual who holds an appointment that is specific to a particular program or research area may be more knowledgeable about the student’s research interests and goals.

The proposed Supervisor must understand the commitment expected in terms of time and funding and be familiar with current graduate program and Faculty of Graduate Studies regulations. The Graduate Coordinator must ensure that supervision will be provided for the probable time period required for the completion of the degree program. If the proposed Supervisor is someone from outside the graduate program who does not have a Continuing Board appointment, a Co-supervisor must be appointed. The Supervisor should be currently active in research in an area related to the student’s interest. Faculty members working on their own graduate degrees cannot be approved in any supervisory capacity without special dispensation from the Dean. For detailed policy and the required forms, see http://www.grad.ucalgary.ca > Policies and Procedures.

1.2.2 Conflict of Interest

The relationship between Supervisor and student is an academic one. Where other relationships exist or develop that might give the appearance of conflict of interest they must be immediately reported to the Graduate Coordinator who can consult with an Associate Dean or the Dean if the Coordinator is unable to resolve the situation. (See Graduate Studies Conflict of Interest Policy: http://www.grad.ucalgary.ca/policies/conflictofinterest).

1.3 Appointment of Co-supervisor

In addition to those cases noted above in which it is required that a Co-supervisor be appointed, a Co-supervisor may be appointed by the Graduate Coordinator upon the written recommendation of the Supervisor and agreement of the student. A postdoctoral fellow as defined in the Postdoctoral Fellow Policy may be appointed a Co-Supervisor. The role of the Co-supervisor in this case is to provide supplementary guidance, instruction and research stimulation on a regular or extensive basis. A student and Supervisor have a shared responsibility to meet on a regular basis.

2.4 Participation of Supervisor in Thesis Preparation

The Supervisor is expected to provide frequent and prompt comments on drafts of the thesis and should attempt to be critically constructive and encouraging but the thesis must be the creation of the student.

2.5 Supervisory Provision for Leave of Absence

(Approved by FGS Council: June 4, 2009)
A program and Supervisor must ensure that the student is provided with adequate supervision during a Supervisor’s leave, potentially through the appointment of an interim Supervisor. Students should be informed well in advance about the Supervisor’s plans for forthcoming leaves of absence. With current means of communication, continued supervision while on a research and scholarship leave is the expectation for faculty members. These arrangements must be communicated in writing to the Graduate Director, who bears the responsibility for ensuring continuity of supervision for students in his/her graduate program.

2.5.1 Interim Supervisory Arrangements

When an interim Supervisor is appointed to cover a period of a Supervisor’s absence, the regular Supervisor retains final responsibility for the adequate supervision of the student. Faculty members appointed as interim Supervisors must indicate in writing to the Graduate Director their willingness to accept responsibility for the day-to-day supervision of such students.

2.6 The Supervisor and Setting up Examinations

The Supervisor is responsible for scheduling the thesis oral examination.

2.7 Suggested Procedures in the Event of Problems between Graduate Students and Their Supervisors

Students should first try to resolve problems with Supervisors by talking to the Supervisor. Supervisory Committee members might be able to give helpful advice in this situation. Problems that are not resolved in this fashion should be discussed with the Graduate Director, and then the Department Head or equivalent. If it appears that a solution cannot be reached, the student and/or the Graduate Director may consult the Faculty of Graduate Studies for advice about a resolution to the matter.

1.4 Supervisor or Co-supervisor from Outside the Department, Program, or Faculty

A Supervisor or Co-supervisor may be from a department, program, or faculty other than the student’s home department, program, or faculty. The recommendation must be endorsed by the student. The faculty member’s home program should be notified by the relevant Graduate Coordinator whenever the faculty member is asked to supervise or co-supervise outside the home program. Such an “external” Supervisor or Co-supervisor must agree to be responsible to the Graduate Coordinator of the student’s home department in all matters related to the supervisory responsibilities.

1.5 Continuity of Supervision

Students are entitled to continuity of supervision. In the case of the resignation from the University, illness or death of the Supervisor, the Graduate Coordinator must make immediate arrangements to provide continuity of supervision pending the appointment of a new Supervisor.

1.6 Supervisor Selection and Approval Deadlines

Regular students are required to have approved Supervisors within twelve months of initial registration. A student admitted as a special case admission must have an approved Supervisor before admission. The Postdoctoral Fellow Policy defines a PDF as “An individual, normally within 5 years of completion of a doctoral degree or 10 years of completion of an MD, DDS, DVM or equivalent, who is engaged in a temporary and defined period of mentored advanced training to enhance the professional skills and research independence needed to pursue his or her chosen career path.” The Postdoctoral Fellow Policy mandates that “assistance with the supervision of graduate students” requires “the agreement of the Faculty Supervisor.”

2.0 Responsibilities of Supervisors

2.1 Knowledge of Rules and Procedures

Supervisors should be familiar with the rules and procedures of the Faculty of Graduate Studies and program regulations and requirements.

2.2 Meetings between Student and Supervisor

A student and Supervisor have a shared responsibility to meet on a regular basis.

2.3 The Role of the Supervisor

The supervisor should act both as a general academic mentor, with emphasis on guidance, instruction, and encouragement of scholarship and research, and as a judge of the student’s performance. Because of their own involvement in research and related professional activities, Supervisors should provide professional guidance and research stimulation to their students. A fundamental duty of the Supervisor is to impart to the student the skills necessary to plan and conduct original research. Specifically, the Supervisor should:

- Work with the student to establish a realistic timetable for the completion of
2.8 Procedures for the Curtailment of Supervisory Duties
The Dean of Graduate Studies approves the initial appointment of a faculty member to supervisory duties. If a complaint is made against a Supervisor, the Dean will first discuss the matter with the Department Head or equivalent, and then with the faculty member concerned. The issue may be resolved informally. If the Dean decides that a more formal approach is needed to resolve the dispute, the Dean will inform both the Head and the faculty member of his/her conclusions in writing. If the result of the Dean’s investigation is curtailment of the supervisory duties of the faculty member, the Dean will inform the faculty member in writing.

2.9 Requirements for a Master’s Supervisory Committee
A Supervisory Committee at the Master’s level is not normally appointed unless required by the program or requested by the Graduate Program Director.

The Faculty of Graduate Studies will recognize a formal Supervisory Committee at the Master’s level once an Appointment of Supervisor/Supervisory Committee form is filed. A Master’s Supervisory Committee will be governed by the rules applying to doctoral Supervisory Committees (see Article 3.0 in Handbook of Supervision and Examination Part III: Doctor of Philosophy / Doctor of Education Degree).

Members of a Supervisory Committee should provide support to both the student and the Supervisor by expanding the range of expertise and experience available to advise and assess the student. Members should provide constructive criticism and discussion of the student’s ideas, methods and performance as the program develops; should be accessible to the student for consultation and discussion; should suggest other sources of information to the student; and must participate in examinations and in periodic meetings with the student and provide regular assessment of the student’s progress as required by the program regulations.

The Master’s Thesis
3.0 Thesis Quality Requirements

The thesis should demonstrate that the candidate is acquainted with the published literature in the subject of the thesis; that appropriate research methods have been used; and that appropriate levels of critical analysis have been applied. The research embodied in the thesis should make some original contribution to knowledge in the field.

The general form and style of the thesis may differ from program to program, but a thesis should be a coherent document. This means that if a thesis contains separate manuscripts, there needs also to be introductory and concluding chapters that explain how these separate manuscripts fit together into a unified body of research. If previously published materials are included, it should be made clear what exactly is the student’s own work and what the contribution of other researchers is.

While it is expected that a portion of the thesis could be the basis for a publication, the Supervisor and examiners should recognize that even an excellent thesis may not be perfect in all respects. “Perfection” is not a prerequisite for acceptance of the thesis as a “partial fulfillment of the requirements for a degree.” The thesis may vary in quality from passable to outstanding.

The University’s policy governing integrity in Scholarly Activity applies to the Master’s thesis. Plagiarism and fabrication or falsification of research data in a Master’s thesis will be considered academic misconduct. (See Plagiarism/Cheating/Other Academic Misconduct section in this Calendar).

Examiners, Examinations and Standards
4.0 Standards of Performance
4.1 Judgement of Student Performance

Supervisors and Graduate Directors must inform students on a regular basis about their academic progress. If a student’s performance is judged to be below an acceptable level, this judgement should be expressed to the student formally and in writing at an early stage in the program as possible. A student may be required to withdraw from the Faculty of Graduate Studies for reasons of “unsatisfactory progress (see also section 5.3).

4.2 Annual Progress Report

The Supervisor and each continuing student must jointly submit an annual progress report on the student’s performance. This form must be signed by the Supervisor, the Graduate Director, and the student, and must be forwarded to the Faculty of Graduate Studies. The student must sign the report after the Supervisor and the Graduate Director have completed their comments to acknowledge that he/she has reviewed these comments.

5.0 Faculty of Graduate Studies Examinations

5.1 Faculty Examination Requirements

Care should be taken to distinguish between Faculty of Graduate Studies examinations and Departmental or Program examinations. The Faculty of Graduate Studies requires a final oral examination of theses. Examiners may participate by teleconference or videoconference (including Voice over Internet Protocol services); telephone backup must be available for video conference examinations. Any requirement for a written comprehensive examination is at the discretion of the department.

5.2 Faculty Regulations for Thesis Examinations

The thesis oral examination is an examination of the Faculty of Graduate Studies. No changes in the composition of the examination committees may be introduced without prior approval from an Associate Dean of Graduate Studies or the Dean of Graduate Studies. The Faculty of Graduate Studies must be informed of minor changes in the scheduling of the examination (e.g., for illness or weather). Changes of more than two weeks will need prior approval by the Faculty of Graduate Studies.

5.3 Program Examination Requirements and Standards

Program requirements may include examinations that are in addition to the Faculty of Graduate Studies requirements. Programs are entitled to set their own standards of adequate performance in such examinations, provided these are not in conflict with Faculty of Graduate Studies standards.

When a student fails to meet either Faculty or program standards, the program may recommend to the Dean of Graduate Studies that the student be required to withdraw (see also section 4.2).

5.4 Communication of Examination Requirements to Students

Programs should provide their students, as early as possible, with information about the precise nature and form of program examinations and tests.

6.0 Thesis Oral Examinations

6.1 Right of Student to Submit and Defend Thesis

A student who has successfully completed all Faculty of Graduate Studies and program requirements has the right to submit and defend a thesis even if doing so may be contrary to the advice of the Supervisor.

6.2 Composition of the Thesis Oral Examination Committee

The thesis oral examination committee shall consist of the student’s Supervisor and at least two other examiners, one of whom shall be external to the student’s home department or program. If there is a Co-supervisor but not a formal Supervisory Committee, two other examiners are still required, one of whom shall be external to the program. If there is a formal Supervisory Committee, only one additional examiner external to the program is required. The composition of the committee must be recommended by the Graduate Director and approved by the Dean of Graduate Studies.

6.2.1 The External Examiner

The external examiner must meet the following criteria:

If from within the University of Calgary, must have a Board appointment outside the student’s program but within the professorial ranks, and have expertise in the student’s research area or a closely related field.

If external to the University of Calgary, must have a well-established research reputation, expertise in the area of the student’s research, and experience in evaluating theses at a graduate level.

In addition, the external examiner must:
Handbook of Supervision and Examination

- Not have collaborated with the supervisor in the last five years;
- Not be related to the student, nor have worked with the student;
- Not have been a supervisor in the student's department or program for the last three years.

An external examiner who does not meet all the criteria is not necessarily precluded from serving on the examining committee, but the Graduate Director must provide the Dean of Graduate Studies with a memo explaining the circumstances. Non-Board appointees to examination committees may be designated as external examiners with the approval of the Dean of Graduate Studies.

6.2.2 Non-Board Appointees on Examination Committees
Persons who are not Board appointees of the University of Calgary may be approved to serve on thesis oral examination committees by the recommendation of the Dean of Graduate Studies by the Graduate Program Director for such an appointment must be accompanied by a curriculum vitae.

6.2.3 The Neutral Chair
The examination is chaired by a neutral member of the academic staff appointed by the Graduate Director. He/she is not a member of the examining committee and is non-voting.

6.2.4 Responsibilities of the Supervisor and the Neutral Chair
The Supervisor arranges scheduling of the examination. The Neutral Chair presides over the oral examination and reports the results to the student. The Neutral Chair gives the report to the Graduate Director who ensures that it is submitted to the Faculty of Graduate Studies within 24 hours of the examination.

6.3 Composition of Examination Committee for Re-take of Thesis Oral Examination
Normally, the composition of the examination committee will remain the same. Upon the recommendation of the Graduate Director and approval of the Faculty of Graduate Studies, an examiner may be replaced.

The deadlines for the recommendation of the examination committee are as for the original examination.

7.0 Scheduling the Thesis Oral Examination
7.1 Supervisor Responsibility
The Supervisor is responsible for scheduling the thesis oral examination.

7.2 Notice of Thesis Oral Examination
The official Notice of Thesis Oral Examination form, indicating the title of the thesis, the time and place of the examination, the names of the recommended examiners, and confirming that the candidate has completed all program requirements, endorsed by the Graduate Director, must be received in the Faculty of Graduate Studies office at least four weeks prior to the time of the examination. The membership of the examination committee must be approved by the Faculty of Graduate Studies.

7.2.1 Posting the Notice of Thesis Oral Examination
A Notice of Thesis Oral Examination form, bearing the names, but not signatures of the student, the Supervisor, the Graduate Director and the Dean of Graduate Studies, or designate, must be posted at least two weeks before the date of the examination. The Graduate Director must ensure that copies of the Notice are sent to the student and to members of the examination committee.

7.2.2 Student Approval of Designated Area of Specialization
The format of the University degree parchment presented to successful candidates shows the degree, the department or area of study, and the approved area of specialization. Students should ensure that the approved area of specialization identified on the Notice of Thesis Oral Examination form is correct, before it is sent to the Faculty of Graduate Studies.

7.3 Form of Thesis
The thesis submitted to the members of the examination committee for final examination must be in all respects a final, complete copy and not a draft.

7.4 Thesis to Examiners
The student must ensure that the thesis is in the hands of the examiners at least three weeks prior to the proposed date of the oral examination. The examination begins when the thesis is distributed. The examiners should not discuss the thesis or their evaluation of it with each other (or anyone else) prior to the oral examination. The Examiner’s Report is considered a confidential document and must not be shared with the candidate or the other examining committee members before the final decision of the examining committee.

7.5 Suspicion of Academic Misconduct
If an examiner suspects that academic misconduct, including plagiarism or fabrication/falsification of data, has occurred in the thesis, he/she must notify the Dean of Graduate Studies immediately. The examination will then be suspended until such time as the Dean or his/her designate determines whether academic misconduct has occurred and what penalties will be applied. Depending on the Dean/designate’s determination, the exam may proceed as scheduled, be rescheduled, or be cancelled.

7.6 Format of Final Thesis Oral Examination
Normally, final thesis oral examinations are open, but only the examiners may question the student. The examiners’ deliberations are private and confidential. Only the Neutral Chair, the examining committee, and, if present, the Department/Program Head and the Dean of Graduate Studies or the Dean’s Representative may be present.

8.0 Conduct of Thesis Oral Examination
8.1 Examiner’s Report on Thesis
(Approved by FGS Council: Nov. 2, 2009)
Before the oral examination, each examiner is required to prepare an assessment of the thesis on the official Examiner’s Report on Thesis form. The oral examination cannot proceed until all of the Examiners’ Reports are submitted to the Neutral Chair. These assessments are to be submitted to the Neutral Chair of the examination committee before the oral examination begins. The assessments are CONFIDENTIAL: they are not to be made available to the student or to the examination committee before the final recommendation of the examination committee. After the examination, the Neutral Chair should submit the reports to the Graduate Director who ensures that they are forwarded to the Faculty of Graduate Studies. After the examination, the graduate program must make the Examiners’ Reports available to the student, upon request.

8.2 Examination Regulations
8.2.1 Formal Examination
The oral examination is a formal examination, not an informal discussion with the candidate.

8.2.2 Questioning of the Candidate
No one other than an examiner (as identified on the Notice of Thesis Oral Examination form) is allowed to question the candidate. All examiners must be given an opportunity to question the candidate early in the examination, e.g., by rounds of questioning.

8.2.3 Length of Examination
The oral examination should not exceed two hours. This does not include deliberation time of the committee.

8.2.4 Editorial Comments on Thesis
Examiners’ editorial comments on the thesis should not be discussed at the oral examination. It is recommended that each examiner hand the student a list of any such comments for post-examination final thesis revisions.

8.3 Suggested Examination Procedures
8.3.1 Opening Summary
It is common practice to ask the student to present a brief (up to fifteen minutes) opening summary of the thesis. Although this is not mandatory, students may appreciate the opportunity to introduce their research work and summarize its significance.

8.3.2 Questions to the Candidate
Questions to the candidate should be relevant to the subject matter of the thesis, and should be clearly and succinctly phrased in order to minimize doubt in the candidate’s mind as to what is being asked. The student should be given reasonable time to answer. If the student has understood the question but cannot answer, the examiner should pass to another question and not attempt to extract an answer by prolonged interroga-
tion. The Neutral Chair should guard against any tendency of examiners to interact with each other instead of concentrating on the examination of the candidate.

9.0 Post Thesis Oral Examination Procedures

9.1 Provisional Recommendations

At the end of the thesis oral examination, everyone except the Neutral Chair, the members of the examination committee, the Department/Program Head and designee and the Dean of Graduate Studies and/or Dean’s representative, is required to withdraw from the room. Before any discussion of the candidate’s performance, each examiner must identify, by secret ballot, whether he/she favours recommending a pass or fail on each of the thesis and the oral defence. This procedure permits each committee with a frame of opinion upon which a full discussion of the student’s performance may then be based.

9.2 Official Examiners’ Discussion

Following a count of the straw vote the Neutral Chair will facilitate a post-examination discussion in which the Department/Program Head and the Dean of Graduate Studies or their representatives may participate although they have no vote. At the conclusion of the discussion, each examiner must write his/her final recommendation on the official Report of Master’s Thesis Examination form. Unanimous decisions are required for both the thesis and the oral defence. If the examiners are unable to achieve unanimity regarding one or both components, there must be no further discussion regarding that component of the examination and the Neutral Chair must immediately inform the Dean of “lack of unanimity”. The final decision will be at the discretion of the Dean of Graduate Studies.

9.3 Recommendation of Examination Committee

Thesis oral examinations are designed to establish a level of achievement consistent with the standards of the Faculty of Graduate Studies as outlined in section 3 “Thesis Quality Requirements.” The following section (9.4) defines the official Faculty recommendations to the Dean of Graduate Studies respecting outcomes of thesis oral examinations. In each case, the committee recommendation must be reported to the Dean on the official Report of Master’s Final Examination form within one working day of the completion of the examination. Immediately following the conclusion of the examination, the Neutral Chair must report the outcome to the student.

9.4 Recommendations

Thesis examinations must be judged to be either acceptable or unacceptable with respect to the thesis itself and, with respect to the oral defence, if the thesis is judged acceptable.

9.4.1 Recommendation for the Thesis

If the unanimous final decision is that the thesis conforms to the requirements for a Master’s thesis (see section 3) then all members of the examination committee shall sign the signature page except the Supervisor, who will sign after reviewing and approving any necessary minor corrections on behalf of the committee.

If the unanimous final decision is that the underlying research reported in the thesis is judged to be sound, but the presentation of or analysis in the research requires attention that one or more members of the examination committee wish to review personally, then those members will not sign the approval page until they have seen and approved the revisions. Other members of the committee should sign immediately after the examination. The Report of the examination should specify who has withheld his/her signature.

If the examination committee unanimously determines that the underlying research is not acceptable, then the examination committee recommends a failed thesis to the Dean of Graduate Studies. The final decision will be at the discretion of the Dean of Graduate Studies. Should the Dean of Graduate Studies uphold the recommendation of “fail”, the candidate will have a second opportunity to present and defend an acceptable thesis. No judgement should be made on the oral defence, because the revised thesis will need to be defended anew.

If the examiners fail to arrive at a unanimous final recommendation, the Neutral Chair must adjourn discussion on this component of the examination, and that same day inform the Dean of Graduate Studies of “lack of unanimity.” The final decision will be at the discretion of the Dean of Graduate Studies.

For either a unanimous decision to fail the thesis or a lack of unanimity, within five working days the Neutral Chair must submit a written report to the Dean of Graduate Studies, describing the examination procedures and copy it to the Graduate Director. Within five working days, each examination committee member must provide a confidential written report to the Dean of Graduate Studies explaining the reasons for his/her recommendation and copy it to the Graduate Director and the Supervisor. After consultation with the Supervisor, the Graduate Director then summarizes the essential points in a written report to the student, copied to the Supervisor.

In the case of a failed thesis, whether by committee or Dean’s decision, only one re-submission will be allowed and a new defence will be required. In view of the magnitude of the revisions required, a second oral exam must be held no sooner than six months and no later than twelve months from the date of the first examination. This new examination will normally be conducted by the original examination committee.

In reporting the results of the second examination, the committee will be limited to recommending either pass or fail. A recommendation for “fail” requires that each examiner submit within five working days a confidential written report to the Dean of Graduate Studies, copied to the Graduate Director, and the Supervisor detailing the reasons for his/her assessments. Within
five working days, the Neutral Chair must also submit a written report of the examination procedures to the Dean of Graduate Studies, copied to the Graduate Director. If the Dean of Graduate Studies upholds the recommendation to fail, the student will be required to withdraw from the Faculty of Graduate Studies.

9.5 Dean’s Action in Lack of Unanimity
When the Neutral Chair of a thesis oral examination does not report a unanimous recommendation, the Dean of Graduate Studies may consult with the Graduate Director, the Supervisor, and the examiners before making a decision. At his/her discretion, the Dean of Graduate Studies may consult with the student as well. A decision should normally be made within seven business days of receiving the required post-examination reports, and all persons involved informed in writing of the result of the decision.

9.6 Exam Procedural Irregularities
Any procedural irregularities should be reported to the Dean of Graduate Studies within 5 working days of the examination date, regardless of the outcome of the exam.

9.7 Convocation Clearance
The names of the candidates who have successfully completed the final thesis oral examination will not be added to the convocation list until the Faculty of Graduate Studies receives two unbound copies of the thesis and a Departmental Clearance Form. Students will continue to be assessed continuing fees until cleared for convocation.

Transfers
10.0 Transfers at the Master’s Level
11.1 Transfer from Master’s to Doctoral Programs
A student requires approval of the Dean of Graduate Studies to transfer from a Thesis-based Master’s Degree to a Course-based Master’s Degree.

11.2 Course and Examination Requirements
Courses credited in the prior Master’s program will be taken as fulfilling doctoral requirements where applicable, in accordance with program requirements for required doctoral course work. All students transferring from Master’s to doctoral programs will be required to sit the doctoral candidacy examination.

11.3 Time Limits on Transfers
Transfers from Master’s to doctoral programs must be completed within 24 months of the student’s initial registration in the Faculty of Graduate Studies. All transfer students must attempt the candidacy examination within 36 months of first registration in the Faculty of Graduate Studies.

Part III: Doctor of Philosophy/Doctor of Education Degree
Supervisors and Supervisory Committees
1.0 Selection of a Supervisor
1.1 General Advice to Students
All students must have either an interim advisor or an approved Supervisor at the time of first registration, and a permanent Supervisor no later than the second annual registration. It would help the student in program planning if the selection of a Supervisor were completed as quickly as possible. Students are encouraged to think about and select their areas of specialization as early as possible, and preferably before beginning the program.

1.2 Supervisor Selection
The initial selection of a Supervisor should be by mutual agreement between student and faculty member(s) approved by the Graduate Director. Difficulties or conflicts in selecting or recommending a Supervisor should be referred promptly to the Dean by any of the persons involved.

1.2.1 Supervisor Eligibility Requirements
Continuity of supervision throughout a graduate program is important to a student’s success. Normally, faculty members with Continuing Board appointments in the professorial ranks are chosen as Supervisors. However, there are occasions when it is to the student’s advantage for a program to recommend the appointment of a Supervisor who does not have a Continuing Board appointment. For example, an individual who holds an appointment that is Specific Term (Contingent, Limited Term, Term Certain), Clinical or Adjunct, or Honorary, or has Emeritus status, and is from outside the University, may be appointed Supervisor. In cases such as these, the Faculty of Graduate Studies requires assurance that the proposed Supervisor will be able to provide continuity.

The proposed Supervisor must understand the commitment expected in terms of time and funding and be familiar with current graduate program and Faculty of Graduate Studies regulations. The Graduate Director must ensure that supervision will be provided for the probable time period required for the completion of the degree program. If the proposed Supervisor is someone from outside the graduate program who does not have a Continuing Board appointment, or is from outside the University of Calgary, a Co-supervisor must be appointed.

The Supervisor should be currently active in research in an area related to the student’s interest. Faculty members working on their own graduate degrees cannot be approved in any supervisory capacity without special dispensation from the Dean. For detailed policy and the required forms, see http://www.grad.ucalgary.ca > Policies and Procedures.

1.2.2 Conflict of Interest
The relationship between Supervisor and student is an academic one. Where other relationships exist or develop that might give the appearance of conflict of interest they must be immediately reported to the Graduate Director who can consult with an Associate Dean or the Dean if the Graduate Program Director is unable to resolve the situation. (See Graduate Studies Conflict of Interest Policy: http://www.grad.ucalgary.ca/policies/conflictofinterest).
1.6 Supervisor Selection and Approval Deadlines
Regular students are required to have approved Supervisors within twelve months of initial registration. Doctoral students admitted as special case admissions must have an approved Supervisor and Supervisory Committee before admission.

2.0 Responsibilities of Supervisors
2.1 Knowledge of Rules and Procedures
Supervisors should be familiar with the rules and procedures of the Faculty of Graduate Studies and program regulations and requirements.

2.2 Meetings between Student and Supervisor
A student and Supervisor have a shared responsibility to meet on a regular basis.

2.3 The Role of the Supervisor
The Supervisor should act both as a general academic mentor, with emphasis on guidance, instruction, and encouragement of scholarship and research, and as a judge of the student's performance. Because of their own involvement in research and related professional activities, Supervisors should provide professional guidance and research stimulation to their students. A fundamental duty of the Supervisor is to impart to the student the skills necessary to plan and conduct original research. Specifically, the Supervisor should: work with the student to establish a realistic timetable for the completion of the various requirements of the program of study; discuss with the student and establish mutual expectations for the student's vacation time; develop a relationship with the student conducive to research and intellectual growth; guide the student in the pursuit of knowledge and provide constructive criticism in support of the highest standards of research and professional development.

2.4 Participation of Supervisor in Thesis Preparation
The Supervisor is expected to provide frequent and prompt comments on drafts of the thesis and should attempt to be critically constructive and encouraging but the thesis must be the creation of the student.

2.5 Supervisory Provision for Leave of Absence
(Approved by FGS Council: June 4, 2009)
A program and Supervisor must ensure that the student is provided with adequate supervision during a Supervisor's leave, potentially through the appointment of an interim Supervisor. In doctoral programs, the interim Supervisor should be a member of the Supervisory Committee. Students should be informed well in advance about the Supervisor's plans for forthcoming leaves of absence. With current means of communication, continued supervision while on a research and scholarship leave is the expectation for faculty members. These arrangements must be communicated in writing to the Graduate Director, who bears the responsibility for ensuring continuity of supervision for students in his/her graduate program.

2.5.1 Interim Supervisory Arrangements
When an interim Supervisor is appointed to cover a period of a Supervisor's absence, the regular Supervisor retains final responsibility for the adequate supervision of the student. Faculty members approved as interim Supervisors must indicate in writing to the Graduate Director their willingness to accept responsibility for the day-to-day supervision of such students.

2.6 The Supervisor and Setting up Examinations
The Supervisor is responsible for scheduling the candidacy examination and the thesis oral examination.

2.7 Suggested Procedures in the Event of Problems between Graduate Students and Their Supervisors
Students should first try to resolve problems with Supervisors by talking to the Supervisor. Supervisory Committee members might be able to give helpful advice in this situation. Problems that are not resolved in this fashion should be discussed with the Graduate Director, and then the Department Head or equivalent. If it appears that a solution cannot be reached, the student and/or the Graduate Director may consult the Faculty of Graduate Studies for advice about a resolution of the matter.

2.8 Procedures for the Curtailment of Supervisory Duties
The Dean of Graduate Studies approves the initial appointment of a faculty member to supervisory duties. If a complaint is made against a Supervisor, the Dean will first discuss the matter with the Department Head or equivalent, and then with the faculty member concerned. The issue may be resolved informally. If the Dean decides that a more formal approach is needed to resolve the dispute, the Dean will inform both the Head and the faculty member of his/her conclusions in writing. If the result of the Dean's investigation is curtailment of the supervisory duties of the faculty member, the Dean will inform the faculty member in writing.

3.0 Doctoral Supervisory Committee
3.1 Composition of the Supervisory Committee
The Supervisor and Graduate Director must inform the Faculty of Graduate Studies of the Supervisory Committee composition no later than three months after the appointment of the Supervisor.

The Supervisory Committee should be constituted by the Supervisor in consultation with the student. It will normally consist of the Supervisor and two members, and must be approved by the Graduate Director and sent to the Faculty of Graduate Studies for information. Committee members may be external to the student's program. At least one of the members of the Supervisory Committee should have had supervisory experience at the doctoral level. If a Co-supervisor and a Supervisor are appointed, the Supervisory Committee will require two other members.

3.2 Non-Board Appointees on Supervisory Committee
Persons who are not Board appointees of the University of Calgary may be approved to serve on supervisory committees. A recommendation to the Dean by the Graduate Program Director for such an appointment must be accompanied by a curriculum vitae.

3.3 Duties of a Supervisory Committee
Members of a doctoral Supervisory Committee should provide support to both the student and the Supervisor by expanding the range of expertise and experience available to advise and assess the student. Members should provide constructive criticism and discussion of the student’s ideas, methods and performance as the program develops; should be accessible to the student for consultation and discussion; should suggest other sources of information to the student; and must participate in examinations and in periodic meetings with the student and provide regular assessment of the student’s progress as required by the program regulations.

The Doctoral Thesis
4.0 Thesis Quality Requirements
The doctoral thesis must embody original work conducted while in program, and must constitute a significant contribution to knowledge. It should contain evidence of critical understanding of the relevant literature. The material embodied in the thesis should merit publication.

The general form and style of thesis may differ from program to program but a thesis should be a coherent document. This means that if a thesis contains separate manuscripts, there needs also to be introductory and concluding chapters that explain how these separate manuscripts fit together into a unified body of research. If previously published materials are included, it should be made clear what exactly is the student’s own work and what the contribution of other researchers is.

While it is expected that the thesis could be the basis for a publication, the Supervisor and examiners should recognize that even an excellent thesis might not be perfect in all respects. ‘Perfection’ is not a prerequisite for acceptance of the thesis as a “partial fulfillment of the requirements for the degree.” The thesis may vary in quality from passable to outstanding.

Plagiarism and fabrication or falsification of research data in a Doctoral thesis will be considered academic misconduct. (See Plagiarism/Cheating/Other Academic Misconduct section in this Calendar).

Examination Committees, Examinations and Standards

5.0 Standards of Performance

5.1 Judgement of Student Performance
Supervisors and Graduate Directors must inform students on a regular basis about their academic progress. If a student’s performance is judged to be below an acceptable level, this judgement should be expressed to the student formally and in writing as early as a stage in the program as possible. A student may be required to withdraw from the Faculty of Graduate Studies for reasons of “unsatisfactory progress” (see also section 6.2).

5.2 Annual Progress Report
The Supervisor and each continuing student must jointly submit an annual progress report on the student’s performance. This form must be signed by the Supervisor, the Graduate Director, and the student, and must be forwarded to the Faculty of Graduate Studies. The student must sign the report after the Supervisor and the Graduate Director have completed their comments to acknowledge that he/she has reviewed these comments.

6.0 Faculty of Graduate Studies Examinations

6.1 Faculty Examination Requirements
The Faculty of Graduate Studies requires that candidates for doctoral degrees sit both an oral candidacy examination and a thesis oral examination. Examiners may participate by teleconference or video conference (including Voice over Internet Protocol services); telephone backup must be available for video conference examinations.

6.1.1 Faculty Regulations for Candidacy Oral Examinations
Candidacy oral examinations are examinations of the Faculty of Graduate Studies. No changes in the composition of the examination committee may be introduced without prior approval from an Associate Dean of Graduate Studies or the Dean of Graduate Studies. The Faculty of Graduate Studies must be informed of changes in the scheduling of the examination.

6.1.2 Faculty Regulations for Thesis Examinations
Thesis oral examinations are examinations of the Faculty of Graduate Studies. No changes in the composition of the examination committee may be introduced without prior approval from an Associate Dean of Graduate Studies or the Dean of Graduate Studies. The Faculty of Graduate Studies must be informed of minor changes in the scheduling of the examination (e.g., for illness or weather). Changes of more than two weeks will need prior approval by the Faculty of Graduate Studies.

6.2 Program Examination Requirements and Standards
Program requirements may include examinations that are in addition to the Faculty of Graduate Studies requirements. Programs are entitled to set their own standards of adequate performance in such examinations, provided these are not in conflict with Faculty of Graduate Studies standards. When a student fails to meet either Faculty or program standards, the program may recommend to the Dean of Graduate Studies that the student be required to withdraw. (See also section 5.1).

6.3 Communication of Examination Requirements to Students
Programs should provide their students, as early as possible, with information about the precise nature and form of program examinations and tests.

7.0 Admission to Candidacy

Admission to candidacy is an acknowledgement that a student is fully prepared to devote his/her full attention to the dissertation research. For admission to candidacy, the Faculty of Graduate Studies requires that (1) all mandatory coursework has been completed, (2) an oral candidacy examination has been successfully passed, and (3) a dissertation research proposal has been approved by the student’s Supervisory Committee. Programs may require the examination and proposal to be completed in any order, including approval of the proposal within the examination.

Although the oral candidacy examination is the official Faculty of Graduate Studies examination, graduate programs have the option of adding a written component. If there is a written component, the period during which the written examination and the oral examination are conducted must not exceed one month. The written examination should be circulated among the examiners and may serve as a basis for questioning at the oral. If the student fails the written component of the candidacy examination, the oral examination should still go ahead as scheduled in order to give the candidate an opportunity to defend the written answers, as well as deal with other questions. If an examiner suspects plagiarism or other academic misconduct in the written document, he/she must report this to the Dean of Graduate Studies immediately. For further information, review Guidelines: Chairing Oral Thesis and Candidacy Examinations, at http://www.grad.ucalgary.ca > Policies and Procedures > Examinations.

7.1 Rationale for Candidacy Examinations
The candidacy examination should focus on the background knowledge of students in their discipline, as well as their preparedness to conduct research of high quality in their particular fields of study.

7.2 Program Guidelines and Regulations
Although the candidacy examination is a Faculty of Graduate Studies examination, individual programs determine the precise requirements. All programs must have written guidelines describing the examination regulations and the timing of the dissertation research proposal relative to the candidacy examination. These guidelines and regulations must be given to doctoral students as soon as they enter the program.

7.3 Assessment of the Candidacy Examinations
Assessment of the candidacy examination must take place immediately following the completion of the oral candidacy examination. This assessment should be based on the candidate’s overall performance in all components of the examination.

7.4 Candidacy Examination and Course Work
All required course work must have been completed prior to the candidacy examination.

No further course work may be required of a student who has successfully completed the candidacy examinations, but a student may elect to complete additional courses subject to approval by the Graduate Director.

7.5 Deadlines for Admission to Candidacy
A student entering a doctoral program with a completed Master’s degree must attempt the candidacy examinations and submit a research proposal acceptable to the Supervisory Committee no later than twenty-eight months after initial registration in the doctoral program. A student entering a doctoral program with a bachelor’s degree, or transferring into a doctoral program from a Master’s program before the Master’s program is completed, must attempt the candidacy examinations and submit a research proposal acceptable to the Supervisory Committee no later than thirty-six months after initial registration in the Faculty of Graduate Studies.

7.6 Establishing the Candidacy Examination Committee
A written recommendation to the Dean of Graduate Studies on the composition of the candidacy examination committee must be received in the Faculty of Graduate Studies office at least four weeks before the scheduled date of the examination. The committee will not be approved by the Faculty of Graduate Studies earlier than three months before the planned examination date.

7.7 Composition of the Candidacy Examination Committee
Normally, the Candidacy Examination Committee consists of the Supervisory Committee plus two additional members recommended by the Graduate Director who shall ensure that no conflict of interest exists between the student or the Supervisor and the additional members of the examination committee. (See Graduate Studies Conflict
8.2 Suggested Examination Procedure
Questions to the candidate should be clear and succinct. The student should be given reasonable time to answer. If the student has understood the question and cannot answer, the examiner should pass to another question and not attempt to extract an answer by prolonged interrogation, or by leading the candidate. The chair should guard against any tendency of examiners to interact with each other instead of concentrating on the examination of the candidate.

8.3 Length of Examination
The candidacy examination should not exceed two hours. This does not include the deliberation time of the Committee.

9.0 Post Candidacy Oral Examination

9.1 Official Examiners’ Discussion
At the end of the candidacy examination, the student is asked to withdraw from the room. If the program has chosen to allow the Supervisor to attend the examination as a non-voting observer, at the end of the candidacy examination the student and the Supervisor are asked to withdraw from the room. Before any discussion of the candidate’s performance, each examiner must identify, by secret ballot, which recommendation (pass/fail) he/she favours. This procedure provides the committee with a frame of opinion upon which to base a full discussion of the student’s performance. The examiners then conduct a post-examination discussion, in which the Department Head or equivalent, or designee (e.g., Graduate Director), and the Dean of Graduate Studies or the Dean’s representative may participate, although they have no vote.

9.2 Recommendation of the Candidacy Examination Committee
After the final vote, each examiner must record a recommendation of pass or fail on the official Faculty of Graduate Studies Report of Candidacy Oral Examination form. Every effort should be made to reach a unanimous recommendation. Should the outcome of the final vote include one negative vote, the candidate will pass. Should the outcome include two or more negative votes, the committee’s recommendation to the Dean of Graduate Studies will be “fail.”

9.3 Re-take of Candidacy Examination
Only one re-take of a candidacy examination will be permitted. The re-take must take place no sooner than two months and no later than six months from the date of the first examination. Normally the composition of the committee will remain the same. In reporting the results of the second examination, the committee will be limited to recommending either a pass (i.e., no more than one negative vote), or fail. A recommendation of “fail” remains in effect within five working days, each examiner must submit a confidential written report to the Dean of Graduate Studies, copied to the Graduate Coordinator and the Supervisor, detailing the reasons for his/her vote. Within five working days of the failed examination, the candidate may appeal the decision to the Dean of Graduate Studies, copied to the Graduate Coordinator. If the Dean of Graduate Studies upholds the recommendation to fail, the student will be required to withdraw from the Faculty of Graduate Studies.

10.0 Thesis Oral Examinations

10.1 Right of Student to Submit and Defend Thesis
A student who has successfully completed all Faculty of Graduate Studies and program requirements has the right to submit and defend a thesis even if doing so may be contrary to the advice of the Supervisor.

10.2 Composition of the Thesis Oral Examination Committee
The thesis oral examination committee shall consist of the student’s Supervisory Committee and at least two other examiners, one of whom shall be external to the student’s home program and the other external to the University. The composition of the committee must be approved by the Dean, upon the recommendation of the Graduate Coordinator. The Dean may approve a recommendation that the examiner external to the University not attend the thesis oral examination in person, but participate electronically, by teleconference or videoconference. In rare cases, the Dean may approve a recommendation that the examiner external to the University not participate in the oral examination in person, but furnish the examination committee with a list of questions to be put to the candidate together with a detailed appraisal of the thesis. When acting in this capacity, the examiner external to the University is designated the external reader.
10.2.1 Examiner External to the University
The Graduate Coordinator must recommend the examiner external to the University to the Dean at least six weeks before the proposed date of the examination on the form Approval of External Examiner or Reader, accompanied by a curriculum vitae. For further guidelines on external examiners and readers, refer to http://www.grad.ualberta.ca > Policies and Procedures > Examination.

10.2.2 Relationship of the Examiner External to the University to the Student
In order to ensure impartiality, the proposed Examiner must not be a close personal friend of the candidate’s Supervisor, have collaborated with the Supervisor in the last five years, be closely related to the candidate, or have worked with the candidate, and must not have been a Supervisor in the candidate’s graduate program for the last three years. If any of the criteria are not met, the proposed Examiner is not necessarily precluded from serving, but the graduate program must clearly explain the circumstances to the Faculty of Graduate Studies.

10.2.3 Non-Board Appointees on Examination Committees
Persons who are not Board appointees of the University of Calgary may be approved to serve on thesis oral examination committees. A recommendation to the Dean of Graduate Studies by the Graduate Coordinator for such an appointment must be accompanied by a curriculum vitae.

10.2.4 The Neutral Chair
The examination is chaired by a neutral member of the academic staff appointed by the Graduate Coordinator. He/she is not a member of the examining committee and is non-voting.

10.2.5 Responsibilities of the Supervisor and the Neutral Chair
The Supervisor arranges scheduling of the examination. The Neutral Chair presides over the thesis oral examination and reports the results to the student. The Neutral Chair gives the report to the Graduate Coordinator who ensures that it is submitted to the Faculty of Graduate Studies within 24 hours of the examination.

10.3 Composition of the Examination Committee for Re-take of Thesis Oral Examination
Normally, the composition of the examination committee will remain the same. Upon the recommendation of the Graduate Coordinator and approval of the Faculty of Graduate Studies, an examiner may be replaced.

10.3.1 Appointment of Examination Committee for Re-take of Examination
The Notice of Thesis Oral Examination must be received in the Faculty of Graduate Studies office at least four weeks prior to the time of the examination. Should a new examiner external to the University be recommended, the Faculty of Graduate Studies must receive the recommendation at least six weeks before the proposed date of the examination on the form Approval of External Examiner or Reader, accompanied by a curriculum vitae.

11.0 Scheduling the Thesis Oral Examination
11.1 Supervisor Responsibility
The Supervisor is responsible for all steps in setting up the thesis oral examination.

11.2 Notice of Thesis Oral Examination
The official Notice of Thesis Oral Examination form, indicating the title of the thesis, the time and place of the examination, the names of the recommended members of the examination committee, and confirming that the candidate has completed all program requirements to proceed to oral examination, endorsed by the Graduate Coordinator, must be received in the Faculty of Graduate Studies office at least four weeks prior to the time of the examination. The membership of the examination committee must be approved by the Faculty of Graduate Studies.

11.2.1 Posting the Notice of Thesis Oral Examination
A Notice of the Thesis Oral Examination form, bearing the names, but not signatures, of the student, the Supervisor, the Graduate Coordinator and the Dean of Graduate Studies, or designate, must be posted at least two weeks before the date of the examination. The Graduate Coordinator must ensure that copies of the Notice are sent to the student and to members of the examination committee.

11.2.2 Student Approval of Designated Area of Specialization
The format of the University degree parchment presented to successful candidates shows the degree, the department or area of study, and the approved area of specialization. Students should ensure that the approved area of specialization identified on the Notice of the Thesis Oral Examination form is correct, before it is sent to the Faculty of Graduate Studies.

11.3 Form of Thesis
The thesis submitted to the members of the examination committee for final examination must be in all respects a final, complete copy and not a draft.

11.4 Thesis to Examiners
The student must ensure that the thesis is in the hands of the examiners (including the examiner external to the University) at least three weeks prior to the proposed date of the oral examination. The examination begins when the thesis is distributed. The examiners should not discuss the thesis or their evaluation of it with each other (or anyone else) prior to the oral examination. The Examiner’s Report is considered a confidential document and must not be shared with the candidate or the other examining committee members before the final decision of the examining committee.

11.5 Suspicion of Academic Misconduct
If an examiner suspects that academic misconduct, including plagiarism or fabrication/falsification of data, has occurred in the thesis, he/she must contact the Dean of Graduate Studies immediately. The examination will then be suspended until such time as the Dean or his/her designate is able to determine whether academic misconduct has occurred and what penalties will be applied. Depending on the Dean/designee’s determination, the exam may proceed as scheduled, be rescheduled, or be cancelled.

11.6 Format of Final Thesis Oral Examination
Normally, final thesis oral examinations are open, but only the examiners may question the student. The examiners’ deliberations are private and confidential. Only the Neutral Chair, the examining committee, and, if present, the Department/Program Head and the Dean of Graduate Studies or the Dean’s Representative may be present.

12.0 Conduct of Thesis Oral Examination
12.1 Examiner’s Report on Thesis
Before the oral examination, each examiner is required to prepare an assessment of the thesis, on the official Examiner’s Report on Thesis form. The oral examination cannot proceed until all of the Examiners’ Reports are submitted to the Neutral Chair. These assessments are to be submitted to the Neutral Chair of the examination committee before the oral examination begins. The assessments are CONFIDENTIAL: they are not to be made available to the student or to the examination committee. After the oral examination, the NeutraChair must submit the reports to the Graduate Coordinator who ensures that they are forwarded to the Faculty of Graduate Studies. After the examination, the graduate program must make the Examiners’ Reports available to the student, upon request.

12.2 Examination Regulations
12.2.1 Formal Examination
The oral examination is a formal examination, not an informal discussion with the candidate.

12.2.2 Questioning of the Candidate
No one other than an examiner (as identified on the Notice of Thesis Oral Examination form) is allowed to question the candidate. All examiners must be given an opportunity to question the candidate early in the examination, e.g., by rounds of questioning.

12.2.3 Length of Examination
Ordinarily, the oral examination should not exceed two hours. This does not include deliberation time of the committee.
12.2.4 Editorial Comments on Thesis

Examiners’ editorial comments on the thesis should not be discussed at the oral examination. It is recommended that each examiner hand the student a list of any such comments for post-examination final thesis revisions.

12.3 Suggested Examination Procedures

12.3.1 Opening Summary

It is common practice to ask the student to present a brief (up to fifteen minutes) opening summary of the thesis. Although this is not mandatory, students may appreciate the opportunity to introduce their research work and summarize its significance.

12.3.2 Questions to the Candidate

Questions to the candidate should be relevant to the subject matter of the thesis, and should be clearly and succinctly phrased in order to minimize doubt in the candidate’s mind as to what is being asked. The student should be given reasonable time to answer. If the student has understood the question but cannot answer it, the examiner should pass to another question and not attempt to extract an answer by prolonged interrogation. The chair should guard against any tendency of examiners to interact with each other instead of concentrating on the examination of the candidate.

13.0 Post Thesis Oral Examination Procedures

13.1 Provisional Recommendations

At the end of the thesis oral examination, everyone except the Neutral Chair, the members of the examination committee, the Department/Program Head or designate and the Dean of Graduate Studies and/or Dean’s representative, is required to withdraw from the room. Before any discussion of the candidate’s performance, each examiner must identify, by secret ballot, whether he/she favours recommending a pass or fail on each of the thesis and the oral defence. This procedure provides the committee with a frame of opinion upon which a full discussion of the student’s performance may then be based.

13.2 Official Examiners’ Discussion

Following a count of the straw vote the Neutral Chair will facilitate a post-examination discussion, in which the Department/Program Head and the Dean of Graduate Studies or their representatives may participate, although they have no vote. At the conclusion of the discussion, each examiner must write his/her final recommendations on the official Report of Doctoral Thesis Examination form. Unanimous decisions are required for both the thesis and the oral defence. If the examiners are unable to achieve unanimity regarding one or both components, there must be no further discussion regarding that component of the examination and the Neutral Chair must immediately inform the Dean of Graduate Studies of “lack of unanimity.” The final decision will be at the discretion of the Dean of Graduate Studies.

13.3 Recommendation of Examination Committee

Thesis oral examinations are designed to establish a level of achievement consistent with the standards of the Faculty of Graduate Studies as outlined in section 4 “Thesis Quality Requirements.” The following section (13.4) defines the official Faculty recommendations to the Dean of Graduate Studies respecting outcomes of thesis oral examinations. In each case, the committee recommendations must be reported to the Dean on the official Report of Doctoral Final Examination form within one working day of the completion of the examination. Immediately following the conclusion of the examination, the Neutral Chair must report the outcome to the student.

13.4 Recommendations

Thesis examinations must be judged to be either acceptable or unacceptable with respect to the thesis itself and, with respect to the oral defence, if the thesis is judged acceptable.

13.4.1 Recommendation for the Thesis

If the unanimous final decision is that the thesis conforms to the requirements for a doctoral thesis (see section 4) then all members of the examination committee shall sign the signature page except the Supervisor who will sign after reviewing and approving any necessary minor corrections on behalf of the committee.

If the unanimous final decision is that the underlying research reported in the thesis is judged to be sound, but the presentation or analysis in the research requires attention that one or more members of the examination committee wish to review personally, then those members will not sign the approval page until they have seen and approved the revisions. Other members of the committee should sign immediately after the examination. The Report of the examination should specify who has withheld his/her signature.

If the examination committee unanimously determines that the underlying research is not acceptable, then the examination committee recommends a failed thesis to the Dean of Graduate Studies. The final decision will be at the discretion of the Dean of Graduate Studies. Should the Dean of Graduate Studies uphold the recommendation of “fail,” the candidate will have a second opportunity to present and defend an acceptable thesis. No judgement should be made on the oral defence, because the revised thesis will need to be defended anew.

If the examiners fail to arrive at a unanimous final recommendation, the Neutral Chair must adjourn discussion on this component of the examination, and that same day inform the Dean of Graduate Studies of “lack of unanimity.” The final decision will be at the discretion of the Dean of Graduate Studies.

For either a unanimous decision to fail the thesis or a lack of unanimity, within five working days the Neutral Chair must submit a written report to the Dean of Graduate Studies, describing the examination procedures and copy it to the Graduate Coordinator. Within five working days, each
examination committee member must provide a confidential written report to the Dean of Graduate Studies explaining the reasons for his/her recommendation and copy it to the Graduate Coordinator and the Supervisor. After consultation with the Supervisor, the Graduate Coordinator then summarizes the essential points in a written report to the student, copied to the Supervisor.

In the case of a failed oral defence, whether by committee or Dean’s decision, the candidate will be given only one further opportunity to present an acceptable defence. The second oral examination will be scheduled and normally heard by the original examination committee not later than six months from the date of the first examination. Any necessary revisions to the thesis must be completed by the candidate and approved by the committee before the second oral examination is scheduled.

In reporting the results of the second oral examination, the committee will be limited to recommending either pass or fail. A recommendation for “fail” requires that each examiner submit within five working days a confidential written report to the Dean of Graduate Studies, copied to the Graduate Coordinator, and the Supervisor, detailing the reasons for his/her assessments. Within five working days, the Neutral Chair must also submit a written report of the examination procedures to the Dean of Graduate Studies, copied to the Graduate Coordinator. If the Dean of Graduate Studies upholds the recommendation to fail, the student will be required to withdraw from the Faculty of Graduate Studies.

13.5 Dean’s Action in Lack of Unanimity

When the Neutral Chair of a thesis oral examination does not report a unanimous recommendation, the Dean of Graduate Studies may consult with the Graduate Coordinator, the Supervisor, and the examiners before making a decision. At her/his discretion, the Dean of Graduate Studies may consult with the student as well. A decision should normally be made within seven business days of receiving all the required post-examination reports, and all persons involved informed in writing of the result of the decision.

13.6 Exam Procedural Irregularities

Any procedural irregularities should be reported to the Dean of Graduate Studies within 5 working days of the examination date, regardless of the outcome of the exam.

13.7 Convocation Clearance

The names of the candidates who have successfully completed the final thesis oral examination will not be added to the convocation list until the Faculty of Graduate Studies receives two unbound copies of the thesis and a Departmental Clearance Form. Students will continue to be assessed continuing fees until cleared for convocation.

Transfers

14.0 Transfers Within Program

14.1 Application for Change of Area of Specialization

A student may apply through the graduate program to the Dean for permission to transfer from one area of specialization to another while remaining within the degree program. Such application must be made prior to the candidacy examination.

15.0 Transfers to Master’s Programs

15.1 Transfer from Doctoral to Master’s Program

A transfer from a doctoral program to a Master’s program, within closely related areas of specialization, may be recommended where, in the opinion of the Graduate Coordinator and the Supervisor, such a transfer is in the best interest of the student. Such application should normally be made before the candidacy examination. Transfers may be approved if the student is unsuccessful in the candidacy oral examination on the first attempt. The Dean of Graduate Studies and the Graduate Coordinator of the Master’s program to which the student transfers must approve the transfer.

15.2 Course and Examination Requirements

Courses credited to the doctoral program may be accepted as fulfilling Master’s course requirements where applicable, in accordance with program regulations for required Master’s course work. Such a student must complete all requirements for the Master’s degree.

15.3 Time Limits on Transfers

Transfers from a doctoral to a Master’s program should normally be completed no later than the beginning of the student’s third annual registration year. All transfer students must complete the Master’s degree program within their fourth registration year.

Part IV: Policy Governing the Relationship Between Supervisor and Student

Introduction

This document addresses the nature of supervisory relationships between graduate students and their Supervisors at the University of Calgary and clarifies the mutual obligations of all parties involved in the graduate supervision process. This document applies to supervisory relationships in both thesis and, where applicable, coursework-based programs. This document is divided into two parts. Part One outlines the responsibilities of the Faculty of Graduate Studies (FGS), the graduate program, the Supervisor, and the student. Part Two focuses upon the process that should be followed if conflicts arise between a student and Supervisor.

Part One

The Faculty of Graduate Studies

Specific responsibilities of the Faculty of Graduate Studies with regard to graduate supervision are as follows:

(a) to act as an advocate for graduate students and graduate programs within and outside the university, and to seek to establish and maintain a climate which promotes academic excellence and expeditious completion of graduate programs;

(b) to offer mechanisms for the resolution of graduate student/Supervisor disputes and other supervisory issues which cannot be settled at the program level;

(c) to advise regarding intellectual property, publication of materials, equity issues, scholarly integrity and other relevant policies and procedures at the University of Calgary.

The Graduate Program

The role of the graduate program is to create a supportive environment within which scholarly work by graduate students can prosper, to provide available resources to support graduate students, and to resolve problems in an expeditious manner. Specific responsibilities are as follows:

(a) to make available to faculty and students a graduate student handbook or collected documents that include current course information, areas of expertise of faculty members, program requirements, funding policies, teaching assistantships, appeal mechanisms, and procedures for progress and completion of Master’s and doctoral programs;

(b) to make available to students relevant non-confidential information on potential Supervisors (e.g., number of current graduate students, funding, time to completion of previous students);

(c) to set up procedures that match students and Supervisors, with the matching to be completed as quickly as possible and in all cases within twelve months of initial registration; a student should not be admitted unless an appropriate Supervisor is available;

(d) to make available a mail delivery point and, wherever possible, desk space;

(e) to monitor progress of the student through ensuring that Annual Progress Reports are completed on time, and to ensure that the student and Supervisor understand that the Annual Progress Report is a critical component of documenting whether the student’s performance is satisfactory;

(f) to inform FGS promptly should there be unresolved concerns about either the Supervisor’s effectiveness or the student’s performance;

(g) to establish clear and fair procedures for such matters as funding, teaching assistantships, and examinations;

(h) to ensure compliance with University of Calgary policies regarding ownership and utilization of data;

(i) to ensure that supervising arrangements are made when research supervisors are absent;
(j) to ensure that the graduate program is free from harassment and discrimination, and that the program’s policies and procedures can accommodate diverse student needs and special circumstances;

(k) to ensure that international students and their Supervisors are made aware of current legislative requirements as defined by Citizenship and Immigration Canada (http://www.cic.gc.ca/) so that applicable student visas and employment authorizations are applied for in a timely fashion and maintained throughout the period of registration in the program;

(l) to ensure that current information is made available to eligible students in regard to deadlines and procedures for awarding graduate and postdoctoral fellowships, GAT’s, GTF’s, and other graduate funding;

(m) to encourage the interaction of graduate students with other students and faculty, and the development of a professional identity through research seminars, posting of conference presentations when there are different expectations on the part of members of the Supervisory Committee;

(n) to maintain an atmosphere conducive to creativity and productivity, and to provide mechanisms for resolving problems which may arise between graduate students and their Supervisors or members of Supervisory Committees;

(o) to provide an avenue whereby students can inform the program of areas where it might be improved.

The Supervisor

The role and responsibilities of the Supervisor are outlined in Article 2 of the Doctoral and Master’s Thesis-based Handbooks. Specific practices constituting good supervision include the following:

(a) to assist the student with the selection and planning of a suitable and manageable research topic with due consideration of the resources necessary for completion of the research project;

(b) to accommodate reasonable demands (e.g., teaching assistantships) or special circumstances or needs of the student that affect the student’s progress;

(c) to be accessible to the student for consultation and discussion of the student’s academic progress and research. The frequency of the meetings will vary according to the discipline and the nature and stage of the project, but normally interaction, which may be electronic, should occur at least once per month;

(d) to respond in a timely manner to written work submitted by the student with constructive suggestions for improvement. The turnaround time for comments on written work should not normally exceed three weeks;

(e) to achieve consensus and resolve differences between the student and the Supervisor or other members of the Supervisory Committee;

(f) to be familiar with the rules and procedures of the Faculty of Graduate Studies, and the graduate program, including the chronological sequence of events and deadlines dates in a student’s program;

(g) to assist the student to be aware of current program requirements, deadlines, sources of funding, and general expectations of examinations;

(h) to help ensure that the research environment is safe, healthy and free from harassment, discrimination and conflict;

(i) to encourage the student to make presentations of research results within the University and to outside scholarly or professional bodies as appropriate;

(j) to acknowledge the contributions of the student in presentations and in published material, including joint authorship, if appropriate;

(k) to discuss with the student the Intellectual Property Checklist (available at http://grad.ucalgary.ca/files/grad/ip_awareness_checklist.pdf) and conform to University and other policies regarding intellectual property, scholarly integrity, and other policies applicable to the research environment.

The Student

In undertaking a graduate program, graduate students make a commitment to devote the time, effort and energy necessary to engage in scholarship. Students should demonstrate initiative in their research, recognize that their Supervisors are responsible for providing guidance as well as evaluating their performance, and be receptive to suggestions and criticisms about their scholarly performance. Whether in a course-based or thesis-based program, students must comply with the rules, procedures and standards in place in the program and at the University and should be familiar with the regulations regarding academic and non-academic matters as per the University Calendars. Specific responsibilities are as follows:

(a) to gain the background knowledge and skills needed to pursue the research project successfully;

(b) to work with the Supervisor on the establishment of a realistic timetable for the completion of the various requirements of the program of study, and to adhere to the timetable and to meet deadlines;

(c) to meet with the Supervisor and Supervisory Committee when requested and to report fully and accurately on progress and on results, and to consider and respond to advice and criticisms received from the Supervisor and the other members of the Supervisory Committee. The frequency of meetings with the Supervisor will vary according to the discipline and the nature and stage of the project, but normally interaction, which may be electronic, should occur at least once per month;

(d) to work with the Supervisor to ensure that appropriate ethics approval is obtained prior to conducting research on animals or humans;

(e) to provide accurate and honest reporting of research results and to uphold ethical norms in research methodology and scholarship;

(f) to discuss with the Supervisor the Intellectual Property Checklist (available at http://grad.ucalgary.ca/files/grad/ip_awareness_checklist.pdf) and conform to University, and other policies regarding intellectual property, scholarly integrity, and other policies applicable to the research environment;

(g) to discuss with the Supervisor faculty and program requirements, including those related to deadlines, thesis or dissertation style, course requirements, and conflict of interest;

(h) to discuss with the Supervisor the responsibility of use of resources, and to assist in obtaining additional resources for the research;

(i) to bring to the attention of the Supervisor other responsibilities and the estimated time commitment (e.g., teaching assistantships) or special circumstances or needs that affect program progress;

(j) to bring to the attention of the Supervisor any matters of conflicting advice or expectations on the part of members of the Supervisory Committee;

(k) to recognize that the Supervisor and other members of the Supervisory Committee may have other teaching, research and personal obligations which may preclude immediate responses;

(l) to work with the Supervisor to meet agreed performance standards and deadlines of the funding organization when financing has been provided under a contract or grant;

(m) to acknowledge the contributions of the Supervisor and others in presentations and in published material, including joint authorship, if appropriate;

(n) to recognize that the research environment is safe, healthy and free from harassment, discrimination and conflict;

(o) to act responsibly upon conclusion of the project by leaving a clean work space, returning borrowed materials, and providing the Supervisor with appropriate documentation of software, data, experimental procedures so that others may continue the research.

Part Two

Resolving Problems Between Students and Supervisors

The relationship between the student and Supervisor is central to graduate education, and is normally close and long-lasting. If the relationship between a student and a Supervisor breaks down, the program has a responsibility to mediate. This is more likely to be successful if attended to as early as possible. Since it is the responsibility of the Graduate Director to arrange for the necessary consultation and mediation, the Graduate Director should be consulted as soon as the conflict becomes apparent. If supervision problems cannot be resolved within the graduate program, the relevant Associate Dean and/or Dean of the Faculty of Graduate Studies may assist.
Should no satisfactory resolution be obtained through consultation and mediation, the Graduate Director may, with well documented and justifiable reasons, recommend that the Supervisor be changed.

It is the responsibility of the graduate program and the Faculty of Graduate Studies to ensure that the student receives an opportunity for an academic experience that includes the proper supervision of the student’s program and thesis (if applicable). Although the graduate program delivers the academic and supervisory component, the Faculty of Graduate Studies must work closely with all parties to ensure that the responsibilities are met. If the best arrangements of the graduate program and the Faculty of Graduate Studies fail to meet the expectations of the student, then no more can be done within that graduate program and the student may decide that the supervisory arrangement is untenable. At such time, the option to apply to another graduate program should be explored or, if that fails, the student may choose to withdraw without prejudice.

It may be that the student is unwilling to accept the supervision provided, or wishes to switch topics from that which was originally indicated at the time of admission. The graduate program and the Faculty of Graduate Studies have no responsibility to agree to alternate supervisory arrangements if they cannot reasonably be accommodated. The graduate program should consult with the Faculty of Graduate Studies and then inform the student clearly about what supervisory arrangements will, or will not, be provided. The graduate program should also clarify whether changing the Supervisor requires approval of a new dissertation proposal. If the student disagrees, the option to withdraw or apply to another graduate program without prejudice remains open. If the student chooses to continue but refuses to accept the supervision provided, then the student is not fulfilling the academic requirement of having a Supervisor (or Supervisory Committee). Therefore, the student may, on academic grounds, be required to withdraw. This is a serious action, and should not be taken unless the graduate program and the Faculty of Graduate Studies have explored with the student all other reasonable solutions.

In some cases, there may be no academic reason for requiring a student to withdraw, but the student’s actions (e.g., disruptive or abusive behaviour) may lead to the breakdown of effective supervision. In such instances, the graduate program shall refer to the University policy on Non-Academic Misconduct or other University policies.

Acknowledgements

This section benefitted significantly from the University of British Columbia document entitled Guidelines for the Various Parties involved in Graduate Student Thesis Research and the University of Alberta’s FGSR Graduate Manual.
Fees and Expenses

All graduate students pay both general and tuition fees each year. The tuition fees listed below are effective May 1 2011 to April 30 2012, and are subject to change without notice.

Tuition Fees

All students are assessed tuition fees. Tuition and general fees must be paid no later than the deadline date indicated for the annual registration month. For information on how to pay your fees, please visit the Enrolment Services website at http://www.ucalgary.ca/registrar/payment.

Thesis-based students: All students in the first year of a thesis-based degree (Master’s or doctoral) program are assessed program fees. New for 2011/12:

- Continuing fees for International students (all programs): $3,604.56
- Continuing fees for Canadian citizens and Permanent Residents per year, pro-rated over four terms: $1,586.26
- Continuing fees for International students per year: $3,604.56

Visiting Students who take courses are assessed general fees and tuition fees on a per course basis. Visiting students who are doing research but are not taking courses are assessed part-time general fees and a tuition fee equivalent to one graduate half course.

**General Fees**

Graduate Students are assessed general fees, which are subject to change without notice, each year.

General fees tied to the students registration anniversary and assessed yearly (Increases to fees effective May):

<table>
<thead>
<tr>
<th>General Fees Chart</th>
<th>Full-Time</th>
<th>Part-Time</th>
<th>All students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Students’ Association (GSA) **</td>
<td>$117.02</td>
<td>$97.52</td>
<td></td>
</tr>
<tr>
<td>Group Insurance</td>
<td>$11.00</td>
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<td>Full-time students only</td>
</tr>
<tr>
<td>Extended Health Insurance</td>
<td>$264.00</td>
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</tr>
<tr>
<td>Dental Insurance</td>
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<tr>
<td>Graduate Bursary Donation</td>
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<td>$10.00</td>
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<tr>
<td>TOTAL</td>
<td>$601.67</td>
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</table>

* Must Opt-out in writing through the Faculty of Graduate Studies before the Fee Payment deadline of your Annual Registration by emailing graduate@ucalgary.ca.

** Must Opt-out online, or by sending the appropriate form and documentation to the Graduate Students Association before the Fee Payment deadline of your Annual Registration.

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Updated

Students in course-based programs who audit courses pay half of the above fees.

**The Government approved market modifier for the MBA program will begin to be implemented in Fall 2011 with MBA students admitted on or after Fall 2011 being assessed the higher of the fees as noted above. Students who are enrolled in a program other than MBA taking MBA courses offered by the Haskayne School of Business will be assessed the MBA Half-Course fee differential with market modifier beginning Fall 2011 regardless of year in program.

General Fees Assessed on a Per Term Basis

Please see the “General Fees Assessed on a Per Term Basis Chart” on page 48.

Late Charges

Students who do not register by the fee payment deadline will be assessed a late registration fee of $60.

Students who make course changes (i.e., additions or substitutions) after the fee payment deadline will be assessed a fee of $60 for each Change of Registration form.

Students in course-based programs are assessed tuition fees by course, based on the level of the course.

Each year, at the time of the student’s annual registration, each course-based student is assessed a non-refundable tuition fee equivalent to a graduate half-course, whether or not the student has registered in a course. This fee will be credited to the first half-course taken in the registration year.

Please note that differential fees are assessed for MBA courses offered by the Haskayne School of Business, for undergradate courses in the Faculty of Medicine and for undergraduate courses in the Faculty of Law. All students who take these courses are required to pay the differential fee. Students in thesis programs who take courses with differential fee assessments will be...
Fees and Expenses

General Fees Assessed on a Per Term Basis Chart

<table>
<thead>
<tr>
<th></th>
<th>Full-Time</th>
<th>Part-Time</th>
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<td>UPASS</td>
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</tr>
<tr>
<td>TOTAL</td>
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<td>$267.31</td>
</tr>
</tbody>
</table>

*Spring registrants will be charged the Spring/Summer amount in May. Summer registrants will be charged the Spring/Summer amount in July, Fall and Winter registrants will be charged the Spring/Summer amount in May. All Spring/Summer services are available May 1st and expire on August 31st.

required to pay the differential fee assessment in addition to their normal program or continuing fees.

Students who audit courses pay half the current course fees. For courses with a differential fee assessment, for example, MBA courses, a student who audits a course pays half the current course fee + half the current differential fee.

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 obtainable 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.

Program-Specific Fees

In addition to the program-specific fees listed below, courses offered off-campus or through distance delivery methods may have tuition charges that differ from the normal tuition policy.

For additional information on fees and payment plans please see: http://www.ucalgary.ca/fees.

Transfers between Course-based and Thesis-based Master’s Programs

A student transferring from a thesis-based route to a course-based route within a program will be assessed according to the tuition policy for course-based programs from the first term of registration in the course-based program.

A student who has completed five or fewer half-courses or equivalent in a course-based route will be assessed program fees for one year from the date of transfer to a thesis route within the program. Continuing fees will be assessed for subsequent years. A student who has completed six or more half-courses or equivalent in a course-based route will be assessed continuing fees from the date of transfer into a thesis-based route within the program.

Courses Taken Extra-to-Program

A student, in a thesis-based or a course-based program, who wishes to take a course that is extra to his/her degree program, will be assessed extra fees per course in addition to the regular graduate tuition assessment.

Extra-to-program courses will not count toward the current graduate degree, but students should be aware that they will be included in all grade point average calculations on the transcript. Registration in any course is subject to departmental approval.

Any appeals regarding fee assessment must be made to the Graduate Associate Registrar (Student Services) within six months of the fee assessment.

Fee Adjustments and Refunds

Students have until the fee payment deadline for the term to make course additions and deletions without penalty.

Students who make course changes after the fee payment deadline will be assessed a $60.00 late fee for each change of Course Registration form processed.

After the fee payment deadline, a student may withdraw from a course up to the last day of lectures, but no refund of any portion of the tuition fees will be made.

A course-based student is assessed a tuition fee equivalent to a graduate half course tuition fee at the time of his/her annual registration. If the student cancels their program registration before the fee payment deadline for his/her annual registration term, the tuition fee will be refunded. If the student withdraws from program after the fee payment deadline for his/her annual registration year, the tuition fee will not be refunded whether or not the student has registered in a course for that term. A course-based student who withdraws from a course before the deadline for fee payment will receive a refund of the tuition fees only if he/she has already taken at least one half course within that registration year.

Thesis-based students who withdraw from individual courses will not have any changes made to their fee assessment for the year.

Thesis-based students who withdraw from a graduate program will have tuition fees prorated to the end of the term in which they withdraw. If the student cancels program registration before the fee payment deadline for his/her annual registration term, the tuition fees will be refunded.

General fees are not refunded following the fee payment deadline.

Payment and Collection of Fees

For information on how to pay your fees, please visit http://www.ucalgary.ca/registrar/payment. Graduate students receiving funding through the University of Calgary may apply for a Payment Plan which arranges the fee payment to be spread over a period of time. For more information and availability, see the FGS website.

Students may pay their fees by cash, cheque, money order or debit card using the following methods:

- Mail a cheque or money order to the Enrolment Services (117 MacKinnie Library Block, University of Calgary, 2500 University Drive N.W., Calgary, Alberta T2N 1N4)
- Through Telephone/Internet Banking Services. The University of Calgary is listed with the Canadian Imperial Bank of Commerce, Bank of Montreal, Royal Bank, Scotiabank, TDCanada Trust, ATB Financial, Alberta, BC & Ontario Credit Unions, Caisse Populaire, First Calgary Savings, HSBC, ING & The National Bank of Canada
- In person at the Enrolment Services (Monday to Friday, 09:30-4:30; Thursday, 10:00-4:30)
- If fees are paid from some form of student assistance, it is the responsibility of the student to advise the Fee Advisor and to produce a letter from the source of the assistance as confirmation. This must be done before the fee payment deadline to avoid penalty.
- If fees are to be paid from government student loans, application must be made through the University of Calgary Student Awards and Financial Aid Office to ensure automatic deferral of payment of fees. If assistance is being provided from a source other than government loans, a letter from the source concerned must be presented to Enrolment Services prior to the prescribed fee deadline date.
- Students receiving disbursement of their student loan in one installment will have both Fall and Winter Term fees deducted...
Any student with an overdue debt to any unit of the University of Calgary, including any administrative department and the Students' Union or Graduate Students' Association, will not be allowed to register, graduate or receive transcripts of grades, and may be denied access to other University services until the outstanding account is settled in full, or an acceptable arrangement has been made.

Program and continuing fees are collected as follows:
- 4/12 in Fall 2/12 in Spring
- 4/12 in Winter 2/12 in Summer
Course-based students' fees must be paid in full by the deadline in the Academic Schedule for the annual registration semester and for each semester in which courses are being taken.

The last date for the payment for late registrants is 10 days after assessment.

**Delinquent Student Accounts**
This policy applies to any student enrolled in a graduate program at the University of Calgary. A student who is having difficulty meeting his/her financial obligations is encouraged to consult with Student Awards and Financial Aid, or the Counselling and Student Development Centre.

If financial assistance is refused, the fees must be paid within ten days. The letter of refusal from Alberta Learning Student Finance must be produced to avoid the late payment penalty. It should be noted that students will not have their registration cancelled if financial assistance is refused and such students will be liable for tuition and general fees owing for the term.

General fees must be paid no later than the deadline indicated in the Academic Schedule for the student’s annual registration month.

### Program Specific Fees Chart

<table>
<thead>
<tr>
<th>Program and Division</th>
<th>Canadian/Permanent Resident</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Graduate Division of Educational Research</strong></td>
<td>$10,950.90</td>
<td>$14,190.83</td>
</tr>
<tr>
<td><strong>EdD Online, HEA, HEL, LEAD, TECH, WAL</strong></td>
<td>$3,934.68</td>
<td>$5,107.92</td>
</tr>
<tr>
<td>Year 1 - 4 (per 12 month year) Program Fee</td>
<td>$10,950.90</td>
<td>$14,190.83</td>
</tr>
<tr>
<td>Continuing (per 12 month year, yrs 5+)</td>
<td>$3,934.68</td>
<td>$5,107.92</td>
</tr>
<tr>
<td>Executive MBA (per 8 months)</td>
<td>$27,482.22</td>
<td>$27,482.22</td>
</tr>
<tr>
<td>Executive MBA in Global Energy Management &amp; Sustainability</td>
<td>$105,000.00</td>
<td>$105,000.00</td>
</tr>
<tr>
<td>GDER Continuing Fees (Anniversary Term per 12 month year)</td>
<td>$1,182.27</td>
<td></td>
</tr>
<tr>
<td>Distance Certificate + Diploma Annual Program Fee</td>
<td>$1,182.27</td>
<td></td>
</tr>
<tr>
<td>Distance MED Annual Program Fee (yrs 4+)</td>
<td>$1,182.27</td>
<td></td>
</tr>
<tr>
<td>Distance 1 half course (3 units)</td>
<td>$1,182.27</td>
<td></td>
</tr>
</tbody>
</table>

| Master of Architecture | | |
| Foundation Year (Fall + Winter term) | $5,256.60 | $11,932.20 |
| 2011-2012 Year 1 (Fall + Winter term) | $7,044.78 | $15,992.88 |
| Students entering before | See “course-based fees”. | See “course-based fees”. |

| Master of Counselling (Distance Delivery) | | |
| Annual Program Fee | $1,540.08 | N/A |
| 1 half course (3 units) | $1,182.27 | N/A |
| MSC in Sustainable Energy Development | | |
| 1 half course (3 units) | $1,740.00 | $2,755.00 |

| Master of Public Policy | | |
| Program Fee | $20,000.00 | $30,000.00 |
### Program Abbreviations

#### Faculty of Arts
- African Studies: AFST
- Anthropology: ANTH
- Archaeology: ARKY
- Art: ART
- Art History: ARHI
- Arts and Science Honours: ASHA
- Canadian Studies: CNST
- Central and East European Studies: CEST
- Chinese: CHIN
- Communications Studies: COMS
- Comparative Literature: COLT
- Culture and Society: CUSP
- Dance: DNCE
- Development Studies: DEST
- Drama: DRAM
- East Asia: ETAS
- East Asian Language Studies: EALS
- East Asian Studies: EAST
- Economics: ECON
- English: ENGL
- Film: FILM
- Fine Arts: FINA
- French: FREN
- General Studies: GNST
- Geography: GEOG
- German: GERM
- Greek: GREK
- Greek and Roman Studies: GRST
- History: HTST
- Humanities: HUMN
- 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 History and Literature: MUHL
- Music Performance: MUPF
- Music Theory and Composition: MUTC
- Native Language: NTVE
- Philosophy: PHIL
- Political Science: POLI
- Psychology: PSYC
- Religious Studies: RELS
- Romance Studies: ROST
- Russian: RUSS
- Science, Technology and Society: STAS
- Slavic: SLAV
- Social Sciences: SOSC
- Sociology: SOCI
- South Asian Societies: SASO
- South Asian Studies: SAST
- Spanish: SPAN
- Strategic Studies: STST
- Term Abroad Program: TAP
- Urban Studies: UBST
- Women's Studies: WMST

#### Faculty of Education
- Applied Psychology: APSY
- Campus Alberta Applied Psychology: CAAP
- Continuing Education: CTED
- Education Teacher Preparation: EDTD
- Educational Research: EDER

#### Faculty of Environmental Design
- Environmental Design: EVDS
- Environmental Design Architecture: EVDA
- Environmental Design Planning: EVDP

#### Haskayne School of Business
- Accounting: ACCT
- Business and Environment: BSEN
- Energy Management: ENMG
- Entrepreneurship and Innovation: ENTI
- Finance: FNCE
- Human Resources and Organizational Dynamics: HROD
- Management Information Systems: MGIS
- Management Studies: MGST
- Marketing: MKTG
- Operations Management: OPMG
- 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
- Outdoor Pursuits: ODPU
- Physical Education: PHED
- Physical Education Activity Theory: PEAT

#### Faculty of Law
- Law: LAW
## Program Abbreviations

### Faculty of Medicine
- Health and Society: HSOC
- Biochemistry and Molecular Biology: MDBC
- Biomedical Technology: MDBT
- Community Health Sciences: MDCS
- Cardiovascular/Respiratory Sciences: MDCV
- Gastrointestinal Sciences: MDGI
- Immunology: MDIM
- Microbiology and Infectious Diseases: MDMI
- Medical Science: MDCS
- Medicine: MDCN
- Neuroscience: MDNS

### Faculty of Nursing
- Nursing: NURS
- Nursing Offsite: NUOS

### Schulich School of Engineering
- Biomedical Engineering: BMEN
- Chemical Engineering: ENCH
- Civil Engineering: ENCI
- Computer Engineering: ENCM
- Electrical Engineering: ENEL
- Engineering, Energy and Environment: ENEE
- Environmental Engineering: ENEN
- Geomatics Engineering: ENGO
- Manufacturing Engineering: ENMF
- Mechanical Engineering: ENME
- Petroleum Engineering: ENPE
- Software Engineering for Engineers: SENG

### Faculty of Science
- Chemistry: CHEM
- Computer Science: CPSC
- Nanoscience: NANS
- Science: SCIE

### Department of Biological Sciences
- Biology: BIOL
- Biological Sciences: BISI
- Ecology: ECOL
- Cellular, Molecular and Microbial Biology: CMMB
- Marine Science: MRSC
- Zoology: ZOOL

### Department of Geoscience
- Geology: GLGY
- Geophysics: GOPH

### Department of Mathematics and Statistics
- Actuarial Science: ACSC
- Applied Mathematics: AMAT
- Mathematics: MATH
- Pure Mathematics: PMAT
- Statistics: STAT

### Department of Physics and Astronomy
- Astronomy: ASTR
- Astrophysics: ASPH
- Medical Physics: MDPH
- Nanoscience: NANS
- Physics: PHYS
- Space Physics: SPPH

### Faculty of Social Work
- Social Work: SOWK

### Faculty of Veterinary Medicine
- Veterinary Medical Sciences: VMS
- Veterinary Medicine: VETM

### Interdisciplinary Specializations
- Biological Anthropology: BANT
- Clinical Research: CLIN
- Energy and Environmental Systems: EESS
- Interdisciplinary Graduate Program: IGP
- Reservoir Characterization: RSCH

### Other
- Academic Writing: ACWR
- Co-operative Education: COOP
- English for Academic Purposes Program: EAPP
- Internship: INTE
- Public Policy: PPOL
- University: UNIV
- University Exchange: UNEX

### Collaborating Faculties
- Architectural Studies (AR, EV): ARST
- Biochemistry (MD, SC): BCEM
- Community Rehabilitation (ED, SW): CORE
- Earth Science (SC, AR): EASC
- Environmental Science (SC, AR): ENSC
- 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
Program Descriptions

Anthropology ANTH

Contact Information
Location: Social Sciences Building, Room 854
Faculty number: 403.220.6517
Fax: 403.284.5467
E-mail address: boydj@ucalgary.ca
Web page URL: http://anth.ucalgary.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based
Students in the Departments of Anthropology and Archaeology and the Faculty of Medicine may choose an interdisciplinary specialization in Biological Anthropology. For further information on the Biological Anthropology (Interdisciplinary) specialization, see the separate listing in this Calendar.

2. Admission Requirements
In addition to Faculty of Graduate Studies and Arts requirements, the Department requires:

Master of Arts
a) A minimum grade point average of 3.30 or higher on a four-point scale.
b) An example of the applicant's written work: a term paper, research paper or other writing which the applicant considers representative of his or her best work.
c) A concise statement outlining the applicant's academic interests and reasons for wishing to pursue graduate work in this Department. The thesis research area should be clearly identified.
d) Completion of Departmental Information form.
e) Two letters of reference.

Doctor of Philosophy
a) A minimum grade point average of 3.40 or higher on a four-point scale.
b) Two letters of reference.

3. Application Deadline
The deadline for the submission of complete applications is February 1 for September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to the required level for admission.

5. Program/Course Requirements
In addition to the Faculty requirements, the Department requires:

Master of Arts
Candidates for the MA degree are normally required to complete a minimum of two full-course equivalents in Anthropology at the 600 level. At the discretion of the Graduate Studies Committee, students with deficient background may be required to take a total of two and one half full-course equivalents of course work in Anthropology. The following courses are required of all Master's students: Anthropology 603, 605, 611 or 613, 631 or 635.

Doctor of Philosophy
a) A specialization of either primatology, or social and cultural anthropology.
b) Anthropology 701, a reading course in the student's substantive area. Beyond that, the supervisory committee will individually tailor each student's course requirements to the student's particular needs.
c) For social and cultural anthropology, fieldwork outside the student's broad cultural milieu for a minimum of one year. Students in primatology will be required to collect primary data via experimental and/or observational research on wild or captive primate populations for a period of not less than twelve months.
d) Demonstrated proficiency in a language other than English. Normally, in the course of the doctoral program, competent faculty in other Departments will evaluate the student's linguistic competence, principally in reading and writing.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.

8. Time Limit
Expected completion time is two years for the Master of Arts degree and four years for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Arts degree and six years for the doctoral degree.

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9. Supervisory Assignments
A supervisor is assigned to each student upon entering the program.

10. Required Examinations
The doctoral candidacy examination has a written and an oral component, and examines areas of knowledge determined by the supervisory committee in consultation with the student.

11. Research Proposal Requirements
Students are required to submit and successfully defend a research proposal fourteen months after initial registration. The defence is open to interested faculty members and graduate students of the Anthropology Department.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance is in the form of research and teaching assistantships and is available to qualified students. Information on awards can be obtained from the Department office or in the Awards and Financial Assistance section of this Calendar. All students are strongly encouraged to seek external financial assistance for the program, as the Department of Anthropology cannot guarantee the availability of financial assistance.

14. Other Information
A complete description of the rules and regulations, and the facilities available to Anthropology graduate students, is available on line at: http://anth.ucalgary.ca/graduate.

15. Faculty Members/Research Interests
Faculty members and their research interests can be found at http://anth.ucalgary.ca/people.

Archaeology ARKY

Contact Information
Location: Earth Sciences Bldg., Room 806
Facility number: 403.220.5227
Fax: 403.282.9567
E-mail address: nethier@ucalgary.ca
Web page URL: http://arky.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based
Students in the Departments of Archaeology and Anthropology and the Faculty of Medicine may choose an interdisciplinary specialization in Biological Anthropology. For further information on the Biological Anthropology (Interdisciplinary) specialization, see the separate listing in this Calendar.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

a) A specimen of relevant written work (an honours essay, term paper, or seminar essay bearing the grade and initials of the supervising professor, the analysis chapter of a Master of Arts thesis or a published article where the applicant is the sole or senior author);
b) A concise statement setting forth the reasons for wishing to pursue graduate work in this department;
c) An up-to-date curriculum vitae;
d) A 3.30 grade point average in the last two years of program or over the last ten full-course equivalents;
e) Two letters of reference from individuals able to evaluate academic potential.

3. Application Deadline
The deadline for the submission of complete applications is January 15 for September admission.

4. Advanced Credit
The Department does not normally give advanced credit.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts

a) Normally, three full-course equivalents including Archaeology 601 and one of the following, as determined by the student’s evaluation committee: Anthropology 615 or 617 or a course in human osteology;
b) A season of fieldwork or the equivalent.

Doctor of Philosophy

a) Normally, four full-course equivalents in Anthropology;
b) For those without a Master of Arts degree, normally five full-course equivalents.

Note: The number of courses required of each student may vary according to each student's particular needs as determined by the supervisory committee. Unless previously satisfied, Archaeology 601 and two of the following: Anthropology 615 or 617 or a course in human osteology will be required as determined by the student's evaluation committee.

c) Normally, the writing of one research paper of publishable quality, as judged by the supervisory committee;
d) A research proposal approved by a committee consisting minimally of three members of his or her supervisory committee, and by the Graduate Director. This must be submitted within twenty months of entering the program.
e) A reading ability in a foreign language acceptable to the Department. The student’s supervisory committee will decide the manner of demonstrating this ability.

f) Normally, proficiency in statistics, acceptable to the Department. The student’s supervisory committee will decide the manner of demonstrating this ability.

Requirements (a) through (f) must be completed before sitting the written and oral components of the candidacy examination.

g) Normally, two seasons of fieldwork. However, students specializing in laboratory-based topics, like physical anthropology, may substitute an approved program of laboratory work for one of the fieldwork seasons.

6. Additional Requirements
During the first two weeks in program, each student will undergo an evaluation. This is not an examination but an assessment of academic background. The specific regulations and procedures covering evaluations and examinations are on file in the Department Office and are available to students. It is the responsibility of every student to become familiar with these regulations.

Fieldwork may be counted towards fulfillment of the full-time study and research requirement.

7. Credit for Undergraduate Courses
 Normally only courses at the 500 level or higher may be taken for credit toward a graduate program.

8. Time Limit
Expected completion time is two years for the Master of Arts degree and four years for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Arts degree and six years for the doctoral degree.

9. Supervisory Assignments
The Department assigns an interim advisor to each student upon arrival. At any time before the end of the first year of studies, each student must select a faculty member to serve as supervisor. The interim advisor may become the supervisor.

Doctoral supervisory committees may be appointed at any time during the first year of studies, but no later than three months after the appointment of the supervisor. The supervisor, in consultation with the student, selects the committee.

10. Required Examinations
Questions on the research proposal will not be included in the oral candidacy examination.

Final thesis oral examinations are open.

11. Research Proposal Requirements
Within twenty months of entering the program, the student, with the supervisor’s advice, develops a thesis research proposal. This is then transmitted to the student’s supervisory committee for agreement and to the Graduate Coordinator for approval and placed on file.
12. Special Registration Information
None.

13. Financial Assistance
Financial assistance in the form of research and teaching assistantships may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Department by January 15.

14. Other Information
The Department has laboratories equipped for anthropometric and osteological analysis, faunal analysis, and microbiological and geoarchaeological research. A number of teaching and comparative archaeological and zooarchaeological collections are maintained. Field equipment including survey, photographic and camping equipment is available.

15. Faculty Members/Research Interests
The active research interests of current faculty members can be found at http://art.ucalgary.ca/contact-us/directory.

Note: Individual specializations are also listed in the Department’s Graduate Brochure, published annually, and available upon request from the Department.

Art ART

Contact Information
Location: Art Building 612
Faculty number: 403.220.6260
Fax: 403.289.7333
E-mail address: artgrad@ucalgary.ca
http://art.ucalgary.ca/graduate

1. Degrees and Specializations Offered
Master of Fine Arts (MFA) thesis-based Specializations: sculpture, printmaking, photography, painting, drawing, media art and technology, interdisciplinary work
Applicants interested in a doctoral degree in Art on a special case basis should contact the Department.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

a) A four-year Bachelor of Fine Arts degree or equivalent qualification
b) A portfolio of 20 recent works presented in jpeg format on disk
c) A three to five page written statement of intent
d) Two reference letters

3. Application Deadline
The deadline for the submission of complete applications is January 15 for September admission.

4. Advanced Credit
Not applicable.

5. Program/Course Requirements
The program core for all Master of Fine Arts students is a minimum of four full courses. Within the first twelve months of the program each student must complete one full-course equivalent 600-level studio course; one half-course equivalent 600-level graduate seminar, and Art 601 and 605. One half-course equivalent 600-level graduate seminar and one full-course equivalent 600-level studio course must be completed in the second twelve months of the program. In some circumstances, the Department may require a student to complete more than the four mandatory full courses.

6. Additional Requirements
Additional requirements for the Master of Fine Arts degree include an exhibition of the student’s work, a supporting paper, and an oral examination.

7. Credit for Undergraduate Courses
Not applicable.

8. Time Limit
Expected completion time for the Master of Fine Arts degree is two years. Maximum completion time is four years.

9. Supervisory Assignments
Each new student is assigned an interim advisor to assist in the planning of the academic program and in orienting the student to the Department’s physical and academic resources. A permanent supervisor is appointed by January 1 of the first academic year of registration. The approval of a permanent supervisor, by the Graduate Program Director, is made after consultation with the student. Supervisors work closely with students in all phases of the program; they have the principal responsibility in assessing the student’s performance, and advising the Department Head of the student’s progress.

10. Required Examinations
Final thesis oral examinations are open. Questions on the research proposal will not be included in the oral candidacy examination of special case doctoral degree students.

11. Research Proposal Requirements
Not applicable.

12. Special Registration Information
The program requires an initial registration as a full-time graduate student for two consecutive years. A minimum of twenty-four months of full-time study is usually necessary to complete the degree requirements.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards see the Awards and Financial Assistance section of this calendar.

Students applying for scholarships must submit their applications to the Faculty of Fine Arts by January 15.

14. Other Information
The Department has extensive facilities for multi-media, mixed media and new media projects.

15. Faculty Members/Research Interests
Faculty members and their research interests can be found at http://art.ucalgary.ca/contact-us/directory.

Biological Sciences BISI

Contact Information
Location: Biological Sciences Building, Room 186
Faculty number: 403.220.6623
Fax: 403.289.9311
E-mail address: biograd@ucalgary.ca
Web page URL: http://www.bio.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based Concentrations of Study include:
Biomolecules, Cells and Microbes
Ecology and Evolutionary Biology
Organismal Biology

2. Admission Requirements
In addition to Faculties of Graduate Studies and Science requirements, the Department requires:

a) A minimum grade point average of 3.20 on a four-point scale during the last two full years or equivalent
b) For students required to provide proof of proficiency in English; a TOEFL score of 580 (written test), or 92 (Internet-based test), or an IELTS score of 7.5, or a MELAB score of 82, or a PTE score of 64
c) A concise statement outlining the applicant’s research interests and reasons for wishing to attend the University of Calgary

d) Three academic reference letters

3. Application Deadline
Deadlines for submission of complete applications for students with international transcripts:
May 1 for September admission
September 1 for January admission
January 1 for May admission

Deadlines for submission of complete applications for students with Canadian or US transcripts:
June 1 for September admission
October 1 for January admission
March 1 for May admission

4. Advanced Credit
Not applicable.
5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Science requirements, the Department requires:

a) Completion of a minimum of one full-course equivalent for both the Master of Science and doctoral programs. Students transferring from the MSc program to the Ph.D. program will be required to take a minimum of one half course in addition to work already completed. Please note that graduate courses must be chosen in consultation with the supervisor and approved by the Graduate Coordinator. Course requirements may include courses offered by other departments;

b) Completion of the appropriate number of Biology 601 Research Seminar courses in addition to (a) above;

c) Presentation of a Departmental Pre-Defence seminar on the results of the thesis research.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
At least one-half of a graduate student’s coursework must be at the 600 level or higher.

Only when appropriate to a student’s program may graduate credit be received for courses numbered 500-599.

8. Time Limit
Expected completion time is two years for the Master of Science degree and four years for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Science degree and six years for the Doctor of Philosophy degree.

9. Supervisory Assignments
Applicants normally contact specific faculty members about possible supervision. The Department does not accept students unless at least one faculty member has indicated a willingness to act as supervisor. The supervisor, in consultation with the student, selects a Supervisory Committee consisting of the supervisor and at least two other faculty members whose research experience will be beneficial to the student’s graduate program.

10. Required Examinations
Doctoral candidacy examinations have a written component followed by an oral component. Doctoral candidates are given three weeks to complete three substantive essays in answer to questions that focus on the student’s field of specialization, submitted by their Candidacy Committee. One week after the submission of the answers, the oral component will take place.

The oral candidacy exam will be based on the written essays and general research knowledge. Questions on the research proposal will not be included in the oral candidacy examination.

Final Thesis Examinations are required at both the Master of Science and doctoral level. A public “Exit” Seminar preceding the examination is required.

11. Research Proposal Requirements
Both Master of Science and doctoral students must present a written research proposal to their Supervisory Committees no later than twelve months after initial registration in program.

12. Special Registration Information
A request to transfer from the Master of Science program to the doctoral program may be made no later than twenty-four months after initial registration. Students who transfer will be required to take one additional half course, regardless of course work completed before the transfer, and are expected to meet the 36-month deadline for the candidacy examination.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for the Open Scholarship Competition must submit their scholarship applications to the Department of Biological Sciences by the appropriate deadline. Please contact georges@ucalgary.ca for further information.

14. Other Information
None.

15. Faculty Members/Research Interests
The research interests of current faculty members can be found at http://bio.ucalgary.ca/research/index.html.

Biomedical Engineering

BMEN

Contact Information
Location: ENA 121C
Faculty number: 403.220.3835
Fax: 403.210.8447
E-mail address: bmegrad@ucalgary.ca
Web page URL: http://www.schulich.ucalgary.ca/Biomedical

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
Master of Engineering (MEng), thesis-based

The curriculum is designed for students with degrees in Engineering, Medicine, Physical Sciences, or Life Sciences. Background experience and qualifications, as well as areas of interest of the applicants will be taken into account at the time of admission. The appropriateness of the undergraduate preparation of the applicant must be supported by the proposed supervisor(s). Students in the MSc and PhD degree programs are normally considered full-time.

The MEng (thesis-based) will focus on Engineering Healthcare Systems Management, and is intended to be taken full-time, although part-time schemes are available. Some aspects of the Biomedical Engineering Graduate program are offered in collaboration with the University of Alberta.

2. Admission Requirements
Students will be admitted to the Faculty of Graduate Studies on the recommendation of the Admissions Committee for the Biomedical Engineering program. Minimum GPA requirements are 3.00 for the MEng (thesis-based) program, 3.20 for the MSc program, and 3.50 for the PhD program, all on a four-point scale.

For admission to the MEng, MSc or PhD program, students must provide two reference letters with their application package. For admission to the MEng (thesis-based) program, students must have an approved undergraduate degree in engineering.

MSc and PhD students can only be accepted upon identification of one or more approved Biomedical Engineering Program graduate supervisors who are willing to supervise and fund the applicant.

International students are required to demonstrate proficiency in the English language, in accordance with the guidelines of the Faculty of Graduate Studies. All students must meet the admission requirements of both the Faculty of Graduate Studies and the Biomedical Engineering Graduate Program.

Transfer of appropriately qualified MSc students directly into the PhD program is encouraged. Students wishing to transfer must do so between 8 and 16 months of first registration. For transfer a minimum GPA (over a minimum of 3 half-course equivalents, including Biomedical Engineering 612 (or 601) and 614 (or 603)) of 3.50 is required. In addition, a research proposal, approved by the supervisory committee, must be submitted to the Biomedical Engineering Graduate Program. Applications for transfer must be supported by both the supervisor and the supervisory committee.

3. Application Deadline
Students applying for MSc and PhD programs may be admitted for September, January, or May. Students applying for the MEng (thesis-based) program may be admitted for September start only. For all programs, deadlines are three months prior to the start of the semester (i.e. June 1 for September admission, etc.) for students holding a degree from a recognized Canadian or US University, and six months prior to the start of the semester (i.e. March 1 for September, admission, etc.) for students holding a degree from another recognized international University.

4. Advanced Credit
Credit may be granted with approval of the Biomedical Engineering Graduate Program. Advanced standing will not be granted for Biomedical Engineering 612 or 614.
5. Program/Course Requirements

MSc/PhD

For a Master of Science degree, all students are required to take a minimum of four half courses as approved by the Biomedical Engineering Graduate Program. Note the sequence of Biomedical Engineering 611 and 612 as well as Biomedical Engineering 613 and 614 each count as one half-course equivalent.

For a Doctor of Philosophy, two further half courses are required beyond the Master of Science requirements. For students who transfer from an MSc program, six graduate half courses are required beyond the BSc, or equivalent, degree.

All MSc and PhD students are required to take two half-course equivalents of Core Courses plus a BME program seminar course (either Biomedical Engineering 605 or 607). The Core Courses are offered as quarter courses (Biomedical Engineering 611, 612, 613 and 614). Students who have an acceptable MSc degree and can demonstrate that they have covered equivalent material to Biomedical Engineering 611 and 613 may opt out of one or both of these courses but must replace these two quarter courses with an elective half course to meet the overall course requirements.

Other courses may be chosen from the listing of Additional Courses or approved courses from other departments (see website for most recent information: http://www.schulich.ucalgary.ca/Biomedical). Other relevant courses, not on the Additional course list or Program’s web site, require the approval of the supervisor and the Biomedical Engineering Graduate Program. Students may be required to take senior undergraduate courses as deemed by their Supervisory Committee, but graduate credit will only be granted for senior undergraduate courses as approved by the Biomedical Engineering Graduate Program.

In addition to the course requirements, all MSc and PhD students are required to complete a research project and to submit a written thesis in compliance with the regulations of the Faculty of Graduate Studies.

Master of Engineering (thesis-based)

For a Master of Engineering (thesis-based), normally eight half courses are required, in accordance with the rules of the Biomedical Engineering Graduate Program and the Faculty of Graduate Studies.

All Master of Engineering (thesis-based) students are required to take two half-course equivalents of Core Courses plus a BME program seminar course (either Biomedical Engineering 605 or 607) plus a project management course at the graduate level (usually Civil Engineering 691), a health economics course at the graduate level (usually Economics 679) and a clinical trials and biomanufacturing course at the graduate level (usually Medical Science 669).

The Core Courses are offered as quarter courses (Biomedical Engineering 611, 612, 613 and 614). One of the remaining three courses must be chosen from the Additional Courses approved by the Biomedical Engineering Graduate Program for Master of Engineering (thesis based) students (see website for most recent information: http://www.schulich.ucalgary.ca/Biomedical). The remaining two courses must include at least one Biomedical Engineering or Engineering (ENXX) course.

In addition to the course requirements, all Master of Engineering (thesis-based) students are required to complete a project-based research project and to submit a written thesis in compliance with the regulations of the Faculty of Graduate Studies.

Core Courses

1. Biomedical Engineering 611 - Fundamentals of Biomedical Engineering – Core Areas
2. Biomedical Engineering 612 - Fundamentals of Biomedical Engineering – Research Areas
3. Biomedical Engineering 613 - Frontiers of Biomedical Engineering – Scientific Communication
4. Biomedical Engineering 614 - Frontiers of Biomedical Engineering – Research Methods

Note that the four listed core courses are quarter courses, though the intention is that most students would take Biomedical Engineering 611 and 612 sequentially in the Fall term, and Biomedical Engineering 613 and 614 sequentially in the Winter term. Biomedical Engineering 611/612 and 613/614 may be taken out of sequence for students first registering in the Winter term.

Additional Courses

1. Biomedical Engineering 605 – Research Seminars of Biomedical Engineering
2. Biomedical Engineering 607 – Research Seminars of Biomedical Engineering
3. Biomedical Engineering 609 – Anatomy and Physiology for Biomedical Engineers
4. Biomedical Engineering 619.XX – Special Problems in Biomedical Engineering

Additional Courses for MEng (thesis-based)

1. Medical Science 668 – Biototechnology Commercialization
2. Medical Science 672 – Biototechnology Business Aspects
3. Medical Science 658.02 – Health Economics II

Additional Courses in Theme 1: Medical Imaging

1. Electrical Engineering 697 - Digital Image Processing
2. Medical Science 689.01– Medical Imaging Techniques
3. Medical Science 689.02– Advanced Magnetic Resonance Imaging
4. Medical Science 689.03– Advanced Medical Image Processing
5. Medical Science 689.04 - Advanced Molecular Imaging
6. Medical Science 689.99 – Medical Imaging Project

Additional Courses in Theme 2: Cell and Tissue Engineering

1. Chemical Engineering 659 – Advanced Cell and Tissue Engineering

Additional Courses in Theme 3: Biomechanics

1. Biomedical Engineering 619.02 – Special Topics in Biomedical Engineering
2. Civil Engineering 651 - Finite Element Mechanics
3. Medical Science 653 – Theory and Application of the Finite Element Method
4. Mechanical Engineering 653 - Continuum Mechanics
5. Mechanical Engineering/Kinesiology/Medical Science 663 - Advanced Biomechanics (Muscle)

Additional Courses in Theme 4: Bioelectrical Engineering

1. Electrical Engineering 623/519.11 - Biomedical Instrumentation
2. Electrical Engineering 663 - Numerical Electromagnetic Field Computation
3. Electrical Engineering 631 - System Identification and Parameter Estimation
4. Electrical Engineering 665 - Bioelectromagnetism

Additional Biomedical Engineering related courses may be listed under other departmental listings - see website for most recent information: http://www.schulich.ucalgary.ca/Biomedical.

Courses are listed by theme, but students are not restricted to taking courses from within a theme. The supervisor and supervisory committee should be consulted for course selection. Courses not listed under Additional Courses or on the list at http://www.schulich.ucalgary.ca/Biomedical require the approval of the Biomedical Engineering Graduate Program.

6. Additional Requirements

Not applicable.

7. Credit for Undergraduate Courses

Graduate credit may be given for 500-level courses. No more than one half course of credit will be allowed in MSc/PhD or MEng program as approved by the supervisory committee, and the Biomedical Engineering Graduate Program.

8. Time Limit

In accordance with the Faculty of Graduate Studies regulations, the expected completion time for the MEng (thesis-based) degree is 18 months, for the MSc is 24 months and for the PhD is 48 months. Students transferring from the MSc to the PhD program are expected to complete studies within 60 months. Funding in the MSc and PhD programs may not be available after these expected completion times.

9. Supervisory Assignments

MSc and PhD students need a supervisor for admission to the program. A supervisi-
Program Descriptions

10. Required Examinations
A written research proposal will be required before the oral candidacy exam can be completed. Prior to the oral candidacy exam, the supervisory committee must review and approve the written research proposal and assess the appropriateness of background preparation of the student. The oral candidacy examination is to focus on two areas: 1) the proposed research project, and 2) the preparation of the candidate and the ability of the candidate to carry out research at the doctoral level. The oral candidacy exam must be completed within 16 months of first registration as a PhD student for direct entry with an MSc, and within the first 20 months for students who transfer from an MSc to PhD program.

A public lecture, scheduled by the Biomedical Engineering Graduate Program, is required immediately prior to MEng, MSc and PhD final thesis oral examinations. The supervisor is a non-voting member of the oral candidacy committee, and is a voting member of the final thesis oral examination committee.

11. Research Proposal Requirements
PhD students must present a written research proposal to the supervisor and to the Biomedical Engineering Graduate Program no later than twelve months after initial registration. Current practice is for MSc and PhD students to enrol in Biomedical Engineering 614, which requires completion and oral presentation of a research proposal. The proposal, with an approval of the supervisor and the coordinator of Biomedical Engineering 614, must be sent to the Biomedical Engineering Graduate Program to be placed in the student’s file.

12. Special Registration Information
None.

13. Financial Assistance
Students in MSc and PhD programs will not be admitted without self-funding or funding from an interested supervisor. Please see the Biomedical Engineering Graduate Program handbook for more details.

Students in the MEng (thesis-based) program do not receive funding, but may be eligible for awards or financial assistance. For more information on awards, see the Awards and Financial Assistance section of this Calendar.

14. Other Information
A Master of Science, Master of Engineering, or Doctor of Philosophy in Biomedical Engineering does not entitle graduates to a designation of Professional Engineer. The title of Engineer, or Professional Engineer, is restricted to those who are members of a Provincial engineering association.

15. Faculty Members/Research Interests
Faculty members in this program are based in the Schulich School of Engineering, and the faculties of Kinesiology, Medicine, Veterinary Medicine and Science. Many BME faculty are cross-appointed to multiple departments. Information about BME faculty research can be found at http://www.schulich.ucalgary.ca/Biomedical.

Chemistry CHEM

Contact Information
Location: Science A Building, Room 109
Faculty number: 403.220.6252
Fax: 403.284.1372
E-mail address: gradinfo@chech.ucalgary.ca
Web page URL: http://www.chem.ucalgary.ca/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
PhD and MSc programs are available for full-time study only.

These areas do not constitute formal divisions, and the thesis research may cut across the traditional lines.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Science admission requirements, the Department requires:

Master of Science and Doctor of Philosophy
a) Two reference letters with reference forms. Letters and forms must bear the referee’s signature and the letter must be printed on official letterhead from the referee’s institution and sent in a sealed envelope or from an institutional email account. The reference form is available from http://www.ucalgary.ca/chem/grad/apply
b) An appropriate letter of recommendation is one written by an individual who can provide an assessment of the applicant’s background and capabilities with respect to our department. An applicant currently registered in a graduate degree program, or who has recently completed a graduate degree program, must submit one letter of reference from his/her program supervisor
c) For applicants required to prove proficiency in English, a TOEFL score of 580 (written test), 92 (Internet-based test), an IELTS score of 7.5, a MELAB score of 83, or a PTE score of 64

Master of Science
For applicants with a Master of Science (MSc) degree:
a) A Master of Science degree recognized by the Faculty of Graduate Studies;
b) An admission grade point average of 3.30 or better on a four-point scale

Doctor of Philosophy
For applicants with a Bachelor of Science (BSc) degree:
a) A four-year Honours degree or its equivalent
b) An admission grade point average of 3.70 or better on a four-point scale

3. Application Deadline
Deadlines for submission of complete applications for students with international transcripts:
March 1 for September admission
July 1 for January admission
November 1 for May admission

Deadlines for submission of complete applications for students with Canadian transcripts:
July 1 for September admission
November 1 for January admission
March 1 for May admission

4. Advanced Credit
Advanced credit for graduate courses taken as an unclassified student, or qualifying student may be given for courses in which the student obtains a grade of “B” or higher. A reduction in course requirements may be given for students who completed graduate courses at other institutions. This will be determined on program entry and after consultation with the research supervisor and the graduate office.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Science requirements, the Department requires:
Master of Science
a) Three half-course equivalents (500-level or above). Normally a minimum of two half courses will be Chemistry courses

Doctor of Philosophy
a) Four half-course equivalents (500-level or above) for students entering with a four-year Honours BSc degree or equivalent. Normally, a minimum of three half courses will be Chemistry courses
b) A minimum of one and a maximum of four half courses for students entering with an MSc degree or equivalent. The number of half courses will be determined by consultation between the student, the supervisor, and the Graduate Director

Students who transfer to the doctoral program will be given credit for courses taken in the MSc program.

6. Additional Requirements
Each student must participate in the Department’s Chemistry 601 and 603 Research Seminars in each year he/she is registered in a graduate program.

A Master of Science student planning to apply for a transfer to a doctoral program must notify his/her supervisor committee at least one month before the committee meeting which takes place at the end of the student’s first year in program.

7. Credit for Undergraduate Courses
At least one-half of a graduate student’s course work must be at the 600 level or higher and only where appropriate to a student’s program will graduate credit be given for courses numbered 500-599, which are considered undergraduate courses. In addition to course prerequisites, consent of department is required.

8. Time Limit
Expected completion time is two years for the Master of Science degree and four for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Science degree and six years for the doctoral program.

9. Supervisory Assignments
Students are assigned an interim advisor (currently the Graduate Director) upon first registration in a program and must choose a permanent supervisor before the fifth month in program.

10. Required Examinations
Doctoral students are required to complete written and oral candidacy examinations. Further details may be obtained from the Department’s Handbook of Graduate Studies available at: http://www.ucalgary.ca/chem/handbook.
The oral examination component will include questions on the research proposal. Final thesis oral examinations are open.

11. Research Proposal Requirements
Students will submit a draft research proposal two to four months before the oral candidacy examination. Within one week of receiving the proposal, the supervisory committee and one additional member of the Department will meet with the student to decide the sub-discipline on which the student will be examined during the candidacy exam. The written component will consist of the finalized version of the research proposal, which is to be submitted 30 days before the oral examination. The proposal is limited to 25 pages (10 on background, 10 on proposed work, and 5 on original extensions of the work). Feedback on the proposal will be provided to the student prior to the oral examination; however, the assessment of the candidate’s overall performance will be determined by the oral examination only.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance is normally available to all qualified students in the form of Teaching Assistantships (TA), Faculty of Graduate Studies Support (FGSS), and Trust funding. TA and FGSS are not normally available beyond twenty-eight months in a Master’s program and fifty-two months in a doctoral program.

For further information on awards, see the Awards and Financial Assistance section of this calendar.

14. Other Information
None.

15. Faculty Members/Research Interests
The faculty members in the Department and their specific research interests can be found at http://www.chem.ucalgary.ca.

Program Descriptions

Communications Studies

COMS

Contact Information
Location: Social Sciences Building, Room 222
Contact number: 403.220.5623
Fax: 403.210.8164
E-mail address: gradprog@ucalgary.ca
Web page URL: http://comsc.ucalgary.ca/graduate

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based
Master of Communications Studies (MCS), course-based

The Doctor of Philosophy program offers specializations in three areas: Social Contexts of Science and Technology; Media and Film Studies; Socio-Cultural Approaches to Communication

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Graduate program in Communications Studies requires:

a) For applicants required to provide proof of proficiency in the English language, a minimum TOEFL score of 600 (written), or 100 (Internet-based) or a minimum IELTS score of 8.

b) A minimum grade point average of 3.00 on a 4-point scale (or equivalent) over the last ten full-course equivalents taken in the applicant’s undergraduate program.

c) A detailed statement of intent (250-500 words)

d) Two samples of written work

e) A detailed curriculum vitae

f) A completed baccalaureate degree in Communications Studies or related field

g) Two reference letters

Master of Communications Studies (course-based, full- or part-time)

Please note: Applications are not being accepted for the 2011 program.
a) For artists required to provide proof of proficiency in the English language, a minimum TOEFL score of 600 (written), or 100 (Internet-based) or a minimum IELTS score of 8.

b) A minimum grade point average of 3.00 on a 4-point scale (or equivalent) over the last ten full-course equivalents taken in the applicant’s undergraduate program.

c) A detailed statement of intent (250-500 words)

d) Two samples of written work

e) A detailed curriculum vitae

f) A completed baccalaureate degree in Communications Studies or related field

g) Two reference letters

3. Application Deadline
The deadline for the submission of complete applications is January 15 for September admission.
4. Advanced Credit
MCS applicants must request advanced credit at the time of admission for graduate level courses up to a maximum of one half-course equivalent. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission. Approval of the Director is required. Advanced credit is not available to MA applicants.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Graduate Program in Communications Studies requires the following:

Master of Arts (thesis-based, six half-course equivalents)

a) Two half-course equivalents: Communications Studies 601 and 615
b) One half-course equivalent chosen from Communications Studies 603, 607, or 623
c) Three half-course equivalent electives.

One half-course equivalent may be selected from other graduate programs; one half-course equivalent elective may be Communications Studies 711, Directed Studies.

Master of Communications Studies (course-based, ten half-course equivalents)

a) Three half-course equivalents including core courses Communications Studies 601, 605, and 615
b) Five elective half courses. One half-course equivalent may be selected from other graduate programs; one half-course elective elective may be Communications Studies 711, Directed Studies

c) Communications Studies 790 - Masters Project. Included as two of the ten half course requirements

Doctor of Philosophy (five half-course equivalents)

a) Three half-course equivalents: Communications Studies 601, 615 or equivalent, and 713
b) One half-course equivalent chosen from Communications studies 603, 607, or 623
c) One half-course equivalent elective may be selected from other graduate programs; one half-course equivalent elective may be Communications Studies 711, Directed Studies.

Note: PhD students who can show that they have taken Communications Studies 601 or equivalent may substitute an elective.

6. Additional Requirements
Not applicable.

7. Credit for Undergraduate Courses
Credit for undergraduate courses toward a Master's program will be given only in the case of the course being developed for graduate level work. Students in the doctoral program will not be given credit for undergraduate courses.

8. Time Limit
Expected completion time is two years for the Master of Arts degree, two years of full-time study or three years of part-time study for the Master of Communications Studies degree, and four years for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Arts degree, and six years for the Master of Communications Studies and Doctor of Philosophy degrees.

9. Supervisory Assignments

Master of Arts
An interim advisor is assigned by the program in the first year. The student must choose a thesis supervisor by the beginning of the second year.

Master of Communications Studies
The Program Director or designate is the assigned interim advisor for the first two years of the student's program for full-time and part-time students. The Program Director or designate is the supervisor for part-time students continuing past two years in the program. In the student's Communications Studies 790 project year, the project supervisor may or may not be the permanent supervisor of record.

Doctor of Philosophy
By June of the first year in program, the student must submit his/her proposed field of research and the name of his/her proposed supervisor for approval by the program. The supervisory committee must be appointed no later than three months after the appointment of the supervisor.

10. Required Examinations

Doctor of Philosophy - Doctoral candidacy examinations have a written and an oral component. Students have three weeks to write papers in three areas relevant to their proposed research. The student's supervisory committee sets the areas and the examination questions in consultation with the candidacy committee. The oral examination takes place one week after the completion of the written papers.

Final thesis oral examinations are open.

11. Research Proposal Requirements
Students whose research involves human subjects must receive approval from the University of Calgary Conjoint Faculties Research Ethics Board before beginning data collection.

Master of Arts – Thesis supervisor must approve proposal.

Master of Communications Studies – Project supervisor(s) must approve proposal.

Doctor of Philosophy – In consultation with the supervisory committee, before the candidacy examinations, each doctoral student is required to submit a preliminary thesis proposal that may serve as an additional basis for questioning. A more detailed, Final Thesis Proposal (including an Application for Ethics Approval where relevant), approved by the supervisory committee must be submitted to the graduate coordinator within six months of the successful completion of the candidacy examination.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on Awards, see the Awards and Financial Assistance section of this Calendar. http://grad.ucalgary.ca/awards

Students applying for open doctoral scholarships must submit their applications to the Department of Communication and Culture Graduate Programs Office by January 15.

14. Other Information
Inquiries concerning specific questions about the program and degree requirements should be directed to: Department of Communication and Culture, Graduate Programs, Social Sciences 222, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4.

15. Faculty Members/Research Interests
The active research interests of current faculty can be found at http://www.comcul.ucalgary.ca/facultyresearch.

Note: Courses that are considered electives will be offered on the basis of student needs and contingent upon the availability of staff resources.

Computer Science CPSC

Contact Information
Location: Information and Communications Technology Building, Room 602
Faculty number: 403.220.6015
Fax: 403.284.4707
E-mail address: cpscapp@ucalgary.ca
Web page URL: http://www.cpsc.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
The Master of Science degree with a specialization in Software Engineering, thesis based.

This specialization is offered jointly through the Department of Computer Science and the Department of Electrical and Computer Engineering. Software Engineering is a formal specialization.

Students may register in the MSc and PhD programs as part-time students only with permission from the department.
2. Admission Requirements
In addition to Faculties of Graduate Studies and Science requirements, the department requires two appropriate letters of reference dated within twelve months of the date of application and:
Master of Science
a) An undergraduate background of either:
   A four-year Bachelor's degree or equivalent in Computer Science from a recognized institution with a minimum GPA of 3.30 in the last 2 years (i.e., last 20 half-course equivalents) of the undergraduate program OR
   A four-year Bachelor's degree or equivalent from a recognized institution with a minimum GPA of 3.30 in the last 2 years (i.e., last 20 half-course equivalents) of the undergraduate program.
In addition, candidates must have an undergraduate course at the 3rd or 4th year level in each of the following computer science areas:
- Theory of Computation
- Software Engineering
- Systems (Operating Systems, Compilers, Distributed Systems, Networking)
- Application (Artificial Intelligence, Graphs, Databases, etc.)

The cumulative GPA for these courses must be at least 3.30.

Post-degree Computer Science courses may be considered in calculating the GPA. Exceptions to the GPA requirements may be considered for students with either:
- Demonstrated research excellence, or
- GRE General scores of at least 600 verbal and 750 quantitative and either 720 analytical (old test format) or 5.5 (new test format)

b) For applicants required to provide proof of proficiency in English, a TOEFL score of 600 (written test) or 100 (Internet-based test), or an IELTS score of 7.5 or above, or a MELAB score of 84 or above, or a PTE score of 70 or above.

c) For students applying with degrees from outside Canada, GRE scores are generally expected and will be considered.

Master of Science degree with a Specialization in Software Engineering (thesis-based)
Students applying for entry to the Master of Science with a specialization in Software Engineering will be assessed on qualification as in (a) above, but with a GPA of 3.00 and at least three years relevant experience in the software industry following the Bachelor's degree.

Doctor of Philosophy
For students applying with a Master of Science degree, all the requirements for a Master of Science (above) apply, plus a thesis-based Master of Science degree from a recognized institution with a minimum GPA of 3.30.

For exceptional students applying with a Bachelor of Science degree, all the requirements for a Master of Science (above) apply, plus a four-year Honours degree or its equivalent from a recognized institution with a minimum GPA of 3.70 and demonstrated research ability.

3. Application Deadline

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<thead>
<tr>
<th>Admission Date</th>
<th>International and Canadian Students</th>
</tr>
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<tbody>
<tr>
<td>September</td>
<td>February</td>
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<tr>
<td>January</td>
<td>May</td>
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4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
Graduate programs must be chosen in consultation with the supervisor and approved by the Computer Science Graduate Affairs Committee. In addition to the Faculties of Graduate Studies and Science requirements, the Department requires:

Master of Science (thesis-based)
a) Course Requirements: Computer Science 699, plus
b) Four additional half-course equivalents.
At least two half courses must be graduate-level computer science courses (labelled CPSC or SENG) and at most one half course can be an undergraduate course numbered at the 500 level.

We recommend that students who are considering continuing on to a doctoral program or entering certain career paths, select courses that demonstrate some breadth across Computer Science (see PhD Breadth Requirements for courses)

c) Seminar Requirement: Students are required to give a department seminar presentation on a topic related to their graduate research

Master of Science degree with a Specialization in Software Engineering (thesis-based)
a) Course Requirements: Computer Science 699, plus
b) Four half-course equivalents. At least three of these half-course equivalents must be taken from the approved SENG list (available from the Department), and at most one half course can be an undergraduate course numbered at the 500 level.

We recommend that students who are considering continuing on to a doctoral program or entering certain career paths, select courses outside the Approved SENG list that demonstrate some breadth across Computer Science (see PhD Breadth Requirements for courses)

c) Seminar Requirement: Students are required to give a department seminar presentation on a topic related to their graduate research

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
For MSc programs, at most one half course at the 500 level may be taken as part of the course work requirement. This must be recommended by the supervisor and approved by the Graduate Director.

For PhD programs, at most two half courses at the 500 level may be taken as part of the course work requirement; at most one of these taken while registered in the current PhD program. This must be recommended by the supervisor and approved by the Graduate Director on the normal Doctor of
Philosophy Course Approval Form (form available from the Department).

8. Time Limit
Expected completion time is two years for thesis-based Master of Science. Expected completion time for doctoral students entering with a Master’s degree is three years, and four years for a student transferring to the doctoral program without a Master’s degree.

9. Supervisory Assignments
Generally, students are admitted to a specific research area and supervisor. Sometimes students are admitted to a specific lab or research area only and are assigned an interim advisor. In the latter case, the student must find a permanent supervisor within six months of the start of the program. Students may seek a change in research area or supervisor after admission. Such a change must be satisfactory to the student, and to the proposed new supervisor. Provided this change meets any current supervisory load constraints, this change will be supported and approved by the Graduate Director.

Doctoral students select their supervisory committee members in consultation with their permanent supervisors.

10. Required Examinations
There is an oral candidacy examination in the doctoral program within the first 28 months of the program but after all course requirements are fulfilled. The scope of the oral candidacy exam is defined by a reading list, the candidate’s research proposal and a single-authored scientific paper on a topic approved by the supervisory committee. The reading list is prepared by the student’s supervisor in collaboration with the supervisory committee, and given to the student at least two months before the oral candidacy exam. The candidate must have written the scientific paper while enrolled in the PhD program. The supervisory committee must have approved the research proposal prior to the oral candidacy exam is scheduled. The candidate’s research proposal together with the reading list and the scientific paper must be submitted to the examination committee when the oral candidacy exam is scheduled (at least 1 month before the oral candidacy exam). The oral candidacy exam may include questions from the scientific paper, the proposal, and the reading list.

Final thesis oral examinations are open.

11. Research Proposal Requirements
At the Master’s level Research proposal requirements are determined by the supervisor.

At the Doctoral level, a research proposal must be approved by the student’s supervisory committee before the oral candidacy exam is scheduled. The research proposal will contain an abstract, a literature survey (including an analysis of the literature), an overview of the proposed research, a plan for completing the proposed research, and references.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards see the Awards and Financial Assistance section of this Calendar. Successful applicants may be offered departmental teaching assistantships and/or research assistantships in their offer letter.

Students should contact the department for information on scholarship deadlines.

14. Other Information
None.

15. Faculty Members/Research Interests
Information on faculty research interests may be found at: http://www.cpsc.ucalgary.ca/Research/.

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**Culture and Society CUSP**

**Contact Information**

Location: Social Sciences Building, Room 222
Contact number: 403.220.5623
Fax: 403.210.8164
E-mail address: gradprog@ucalgary.ca
Web page URL: http://www.comcul.ucalgary.ca/graduate

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based
The Doctor of Philosophy program offers specializations in three areas: Heritage and Identity; Development Studies; and Social and Global Justice.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Graduate Program in Culture and Society requires:

**Master of Arts (thesis-based, full- or part-time)**

a) For applicants required to provide proof of proficiency in the English language, a minimum TOEFL score of 600 (written), or 100 (Internet-based) or a minimum IELTS score of 8.

b) A minimum grade point average of 3.00 on a 4-point scale (or equivalent) over the last ten full-course equivalents taken in the applicant’s undergraduate program.

c) A written statement of intent (250-500 words)

d) A current curriculum vitae

e) Two sample of applicant's written work

**Master of Arts (directed studies)**

f) A completed baccalaureate degree

g) Two letters of reference

3. Application Deadline
The deadline for the submission of complete applications is January 15 for September admission.

4. Advanced Credit
Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission. Advanced credit is not available to MA applicants.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Graduate Program in Culture and Society requires:

**Master of Arts (thesis-based, full- or part-time)**

a) Three half-course equivalents: Culture and Society 601, 615, and 615; or Culture and Society 603, 613, and 615; or other graduate programs; one half-course equivalent elective may be selected from other graduate programs; one half-course equivalent elective may be Culture and Society 711: Directed Studies.

**Master of Arts (directed studies)**

b) One half-course equivalent elective may be Culture and Society 603, 605, or 607;

c) Two half-course equivalent electives.

**Doctor of Philosophy (five half-course equivalents)**

a) Three half-course equivalents: Culture and Society 601, 713, and 615;

b) One half-course equivalent chosen from Culture and Society 603, 605, or 607;

c) Two half-course equivalent electives.

**Doctor of Philosophy (five half-course equivalents)**

a) Three half-course equivalents: Culture and Society 601, 713, and 615 or equivalent;

b) One half-course equivalent chosen from Culture and Society 603, 605, or 607;

c) One half-course equivalent elective at the 600 or 700 level.

6. Additional Requirements
Not applicable.

7. Credit for Undergraduate Courses
Credit for undergraduate courses toward a Master’s program will be given only in the case of the course being developed for graduate level work. Students in the doctoral program will not be given credit for undergraduate courses.
8. Time Limit
Expected completion time is two years for the full time Master of Arts degree, three years for the part time Master of Arts degree, and four years for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Arts degree and six years for the Doctor of Philosophy degree.

9. Supervisory Assignments

Master of Arts
An interim advisor is assigned by the program in the first year. The student must choose a thesis supervisor by the beginning of the second year.

Doctor of Philosophy
By June of the first year in program, the student must submit his/her proposed field of research and the name of his/her proposed supervisor for approval by the program. The supervisory committee must be appointed no later than three months after the appointment of the supervisor.

10. Required Examinations

Doctor of Philosophy
Doctoral candidacy examinations have a written and an oral component. Students have three weeks to write papers in three areas relevant to their proposed research. The student’s supervisory committee sets the areas and the examination questions in consultation with the candidacy committee. The oral examination takes place one week after the completion of the written papers.

Final thesis oral examinations are open.

11. Research Proposal Requirements

Students whose research involves human subjects must receive approval from the Faculty of Communications and Culture Ethics Review Committee and the University of Calgary Conjoint Research Ethics Board before beginning data collection.

Master of Arts
Thesis supervisor must approve proposal.

Doctor of Philosophy
In consultation with the supervisory committee, before the candidacy examinations, each doctoral student is required to submit a preliminary thesis proposal that may serve as an additional basis for questioning. A more detailed, Final Thesis Proposal (including an Application for Ethics Approval where relevant), approved by the supervisory committee must be submitted to the graduate coordinator within six months of the successful completion of the candidacy examination.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on Awards, see the Awards and Financial Assistance section of this Calendar. http://grad.ucalgary.ca/awards.

Students applying for open doctoral scholarships must submit their applications to the Department of Communication and Culture Graduate Programs Office by January 15.

14. Other Information

Inquiries concerning specific questions about the program and degree requirements should be directed to: Department of Communication and Culture, Graduate Programs, Social Sciences 222, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4
Phone: 403.220.5623.

15. Faculty Members/Research Interests

The active research interests of current faculty can be found at http://www.comcul.ucalgary.ca/facultyresearch.

Note: Courses that are considered electives will be offered on the basis of student needs and contingent upon the availability of staff resources.

Drama DRAM

Contact Information
Location: Craigie Hall D 100
Department number: 403.220.5313
Fax: 403.292.6925
E-mail address: dramgs@ucalgary.ca
Web page URL: http://www.finearts.ucalgary.ca/drama/

1. Degrees and Specializations Offered

Master of Fine Arts (MFA) (thesis-based)
Specializations: Directing, Design/Technical, Playwriting, Theatre Studies
Students will generally be accepted and registered on a full-time basis. Part-time registration will be considered on an individual basis.

2. Admission Requirements

In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

a) A baccalaureate degree that has clearly included a major emphasis in the study of drama with study at the undergraduate level in the proposed area of specialization. Deficiencies of background may be corrected during a year of study as a qualifying student
b) A written application including a biographical outline of the applicant’s studies and experience in theatre and a statement of intent outlining proposed projects in the Department. When the applicant intends to study in the Design/Technical area, a portfolio of drawings and design work is required. Applicants to the Playwriting area must submit a portfolio of original creative writing. Applicants to the Theatre Studies area must submit samples of their written work

c) Two letters of reference

d) A portfolio of drawings and design work is required for Design/Technical candidates.

3. Application Deadline

The deadline for the submission of complete applications is January 15 for September admission. In exceptional circumstances, at the discretion of the Graduate Committee, January admission may be possible. Inquiries should be addressed to the Graduate Director and all admission materials submitted to the Department by October 15 for consideration.

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements

In addition to Faculties of Graduate Studies and Arts requirements, the Department also specifies the following requirements:

a) Directed candidates must enrol in Drama 610, 647 and 649 in the first year.

b) Design/Technical candidates must enrol in at least four of the designated courses that includes Drama 623, 625, 627 and 629. Candidates must complete, to the satisfaction of an examining committee, a portfolio and an oral review relating to their design work at the completion of the first three full courses. Details concerning the portfolio and procedures to be followed in case of failure are on file in the Department of Drama office.

c) Playwriting candidates must enrol in Drama 671 and 673 in the first year. Drama 647 and 649 are also required courses.

d) Theatre Studies candidates must enrol in Drama 647 and 649 in the first year.

6. Additional Requirements

a) For Directing candidates, the thesis will consist of the direction of a full-length play and a supporting paper that reflects critically on the production and on the process of its creation.

b) For Design/Technical candidates, the thesis will consist of the design of a full-length production in two of the following areas: scene design, costume design, light design, sound design. Technical Direction may serve as one of the areas. Pictorial material and a supporting paper that reflects critically upon the production and the process of its creation are also required.

c) For Playwriting candidates, the thesis will consist of a full-length play and a supporting paper that reflects critically on the play and the process of its creation.

Drama DRAM
7. Credit for Undergraduate Courses
The Department of Economics may give credit for undergraduate courses at the 500 level at the discretion of the supervisor and graduate committee. No more than half of a student’s program may be done at the undergraduate level.

8. Time Limit
The Master of Fine Arts degree must be completed within four years.

9. Supervisory Assignments
The graduate committee assigns a supervisor after discussion with the student.

10. Required Examinations
Final thesis oral examinations are open.

11. Research Proposal Requirements
Research proposals are formulated by the student in consultation with the supervisor and approved by the graduate committee. The committee will follow the University’s policies on ethical conduct in research in its review of proposals.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships must submit their applications to the Department by February 1.

14. Other Information
None.

15. Faculty Members/Research Interests
The interests and research specialties of the staff can be found at http://drama.ucalgary.ca/contact-us/directory.

Economics ECON
Contact Information
Location: Social Sciences Building, Room 454
Faculty number: 403.220.6064
Fax: 403.282.5262
E-mail address: dalip@ucalgary.ca
Web page URL: http://econ.ucalgary.ca/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based and course-based
The Department offers a formal specialization in Health Economics. Other specializations are arranged informally, determined by the research interests of the student.

There is a requirement of full-time study for the course-based and thesis-based Master of Arts and doctoral programs.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts
a) A minimum of four full-course equivalent economics courses. These must include the equivalent of Economics 395/495/497 (econometrics), Economics 387/389 (mathematics for economists), Economics 557 (senior microeconomics), and Economics 559 (senior macroeconomics), with at least a “B” average in senior economics courses.
b) Three reference letters
Doctor of Philosophy
a) The requirements listed above for the Master of Arts program. Doctoral candidates may require greater proficiency in Mathematics.
b) A Master of Arts degree in Economics or its equivalent, with a high level of proficiency in Microeconomic Theory, Macroeconomic Theory, and Econometrics. If courses have been taken more than five years ago, students may be required to upgrade their knowledge in these fields.
c) Three reference letters.

3. Application Deadline
Deadline for submission of complete applications is February 1 for September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts (thesis-based)
a) For students holding an Honours Economics degree with credits in Economics 387, 389, 395, 495, 497, 557 and 559 or their equivalents, the completion of three full graduate courses in Economics. Such students may be able to complete the degree in one year. In special cases the Department may allow students to substitute one full or two half courses from a related discipline for one of the elective graduate courses in Economics.
b) For students without an Honours Economics degree or students whose Honours degree in Economics does not include the undergraduate courses specified in (a) or their equivalents, the completion of such courses as are required to raise their competence to the appropriate level. Graduate course requirements for such students are the same as in (a). Such students may be able to complete the degree in two years.
c) The completion of Economics 615, 657, and 659 unless one or more of them is explicitly exempted by the requirements for a specialization.

Master of Arts (course-based)
The departmental academic requirements for the course-based Master of Arts degree are comparable to those for the thesis-based Master of Arts specified above. The differences in the course-based program are:
a) The thesis requirement is replaced by two additional full graduate courses (making a total of five full courses).
b) The courses from a related discipline are increased to one and one-half of the elective graduate courses in Economics.

c) A research paper. The topic may be a limited empirical research project, a critical review of the literature in a particular area, or a critical analysis of a theoretical or important policy problem.
d) An exit requirement consisting of a research defence in an open conference and if unsuccessful a comprehensive written examination.

Master of Arts (thesis-based or course-based) with a Specialization in Health Economics
a) The completion of Economics 679 and 681 as two of the six half courses required in the thesis-based program, or as two of the ten half courses required in the course-based program.
b) Students may be excused from the requirement that they take Economics 659. However, if they are contemplating continuing on to a doctoral program, they are cautioned that most doctoral programs will require a course that is equivalent to Economics 659.

Doctor of Philosophy
The Department of Economics requires that doctoral students take twelve one-semester courses. Required courses include two courses each in econometrics, Economics 615 and 715, microeconomic theory, Economics 657 and 757, and macroeconomic theory, Economics 659 and 759. In addition, students must take six one-semester courses in “field” areas. Students are also recommended to take a non-credit one-week course in the Fall Session Block Week (the week prior to the start of classes) of the first year in Mathematical Economics (Economics 600). The Department allows for the possibility that Master’s-level courses and course work taken at other institutions may be substituted for some of the required doctoral courses. Decisions concerning course substitutions and the transmissibility of graduate courses from other institutions are made on a case-by-case basis. Students are advised that the comprehensive theory examinations, which are required of all doctoral students, include material from the core courses listed above.
6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Credit is not given for undergraduate courses.

8. Time Limit
Expected completion time for students studying on a full-time basis is two years for the Master of Arts thesis-based and one year course-based, and four years for the Doctor of Philosophy. Maximum completion time is four years for the Master of Arts (thesis-based and course-based) and six years for the Doctor of Philosophy.

9. Supervisory Assignments
The process by which students are matched with supervisors is an informal one, based on mutual research interest.

10. Required Examinations
Doctor of Philosophy
Doctoral students are required to pass a written comprehensive examination in each of Microeconomic Theory and Macroeconomic Theory. Each examination will be three hours long. These examinations shall be scheduled in May of their first year. In August, students who fail one or more of the comprehensive theory examinations shall be given a second opportunity to pass those examinations they failed. Students who do not pass their comprehensive theory examinations by the second sitting shall be required to withdraw from the program.

Doctoral students are required to pass a written comprehensive field examination in two fields of study. The written comprehensive field examinations shall each be three hours long. These examinations shall normally be scheduled in June of the second year. Students who fail one or more of the written comprehensive field examinations shall be given a second opportunity in August to pass those examinations they failed. Students who do not pass their written comprehensive field examinations by the second sitting shall be required to withdraw from the program.

The oral candidacy exam will include examination on general research knowledge, information from the written examinations and the research proposal.

Students who do not pass their oral candidacy examination by the twenty-eighth month of their program shall be required to withdraw from the program.

11. Research Proposal Requirements
Doctoral students are required to have a thesis proposal approved by the department before the candidacy examination.

12. Special Registration Information
Not applicable.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, please see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Department by February 1.

To be eligible for funding beyond the first year, a student must pass all comprehensive theory examinations by the beginning of classes of their second year. To be eligible for funding beyond the Fall Term of the third year, a student must pass their comprehensive field examination and their oral candidacy examination by the beginning of Winter Term courses in their third year.

14. Other Information
None.

15. Faculty Members/Research Interests
The active research interests of the current faculty can be found at:
http://econ.ucalgary.ca/contact-us/directory.

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Program Descriptions

Education Graduate Programs
Contact Information
Location: Education Tower,
Faculty number: 403.220.5675
Toll free in Canada 877.623.0292
Fax: 403.282.3005
E-mail address: gder@ucalgary.ca
Web page URL: http://edu.ucalgary.ca/gder
Beginning on July 1, 2010, the Faculty of Education will be changing its organizational structure for the administration of all graduate programs from Divisions, APSY- Applied Psychology and GDER- Graduate Division of Educational Research, to four ‘Educational Studies Areas’ (EDSAs). These EDSAs will be the academic homes for faculty members and students whose research, expertise and interests are aligned with these areas. All of our current graduate students, degrees and specializations have applied for accreditation by the Office of Graduate Programs in the Faculty of Education.

For more information, specific details on this transition and changing contact information, please consult the Faculty of Education Website at http://educ.ucalgary.ca/ and also the online updates of the Graduate Calendar at http://www.grad.ucalgary.ca/calendar.

Please see the Applied Psychology and Graduate Division of Educational Research program entries in this Calendar for program details and requirements.

Applied Psychology
Contact Information
Location: Education Tower, Room 902
Faculty number: 403.220.5651
Fax: 403.282.9244
Email: apsinfo@ucalgary.ca
Web page URL: http://www.educ.ucalgary.ca/apsy/

Specializations Offered
School and Applied Child Psychology
Counselling Psychology
The Educational Studies in Psychology Area in the Faculty of Education offers Master’s and Doctoral Applied Psychology (APSY) programs in both Counselling Psychology (CP) and School and Applied Child Psychology (SACP). At the Masters level we offer both thesis-based (MSc) and course-based degrees (M.Ed. & MC). Both degree streams prepare students for roles as psychologists and counsellors though further steps (and possibly, courses) will be required to meet professional registration requirements.

Note: The Counselling Psychology and School and Applied Child Psychology specializations have applied for accreditation of their Doctoral programs by the Canadian Psychological Association (CPA).

1. Degree Doctor of Philosophy
Counselling Psychology

2. Admission Requirements
In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the CP PhD program include:

(a) A completed thesis-based Master’s degree in Counselling Psychology or equivalent from an approved university, with a minimum grade point average of 3.5 in the Master’s program. If coursework from an applicant’s Master’s program is not equivalent to courses from the Master of Science in Counselling Psychology at the University of Calgary, the student will be required to take additional courses within the doctoral program to ensure equivalent training.

(b) Two senior undergraduate or one graduate half-course in i) biological bases of behaviour, (ii) cognitive-affective bases of behaviour, (iii) social bases of behaviour, and (iv) individual behaviour.

(c) One senior undergraduate or one graduate half-course in the historical and scientific foundations of general psychology.

(d) If all of the prerequisite courses for admission to the PhD program in Counselling Psychology have not been completed at the time of application, students who have up to two full-course equivalents in deficiencies may still be admitted, but the prerequisite courses will need to be completed before the doctoral candidacy examination.

(e) A typed résumé and a concise rationale (500 words or less) for the application.

(f) Two letters of reference.

3. Application Deadline
On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply.

The deadline for the submission of complete applications to all programs is December 1 for September admission.
Program Descriptions

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:

Students who have completed the prerequisites in the areas of (a) biological bases of behaviour, (b) cognitive-affective bases of behaviour, (c) social bases of behaviour, (d) individual behaviour, (e) historical and scientific foundations of general psychology, and (f) the courses and thesis required of students on the Master of Science program in Counselling Psychology will be required to complete:

- two doctoral-level full-course equivalents normally including Applied Psychology 731, 742, and one half-course in research methods.
- a non-credit research seminar
- a candidacy examination
- a dissertation
- a twelve-month full-time internship: Applied Psychology 788

Students who are deficient in prerequisites will be required to take additional courses on their programs once admitted. A student may be deficient in up to two full-course equivalents, which must be completed before the PhD candidacy examination.

Course content addresses theory, research, and practice in the domains identified by the Canadian Psychological Association (CPA) for accreditation of doctoral programs in professional psychology.

Detailed information on program and core course requirements can be obtained from the Division website in the document Counselling Psychology Information Booklet and from the Faculty of Education Office of Graduate Programs.

Note: First year students are assigned an interim advisor who will assist with course selection.

6. Additional Requirements
Applied experience is an asset.

7. Credit for Undergraduate Courses
The Division does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit
The Doctor of Philosophy degree should be completed in four years. Maximum completion time allowed for the Doctor of Philosophy degree is six years.

9. Supervisory Assignments
An interim advisor is assigned to each first-year student in a thesis-based program. Students are responsible for initiating discussions with potential permanent supervisors and are expected to have finalized supervisory arrangements by their second annual registration.

10. Required Examinations
Candidacy examinations for the doctoral program both have written and oral components.

Information on examinations is provided on the Graduate Programs in Education website.

11. Research Proposal Requirements
Information on research proposals is available through the interim advisor/Supervisor.

Ethics approval is needed for all research projects involving the use of human subjects before data collection begins. To initiate the ethics review, the researcher must submit a copy of the application (available on the Research Services website) to the Conjoint Faculties Research Ethics Board, c/o Associate Dean (Research), Faculty of Education.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

14. Other Information
For further information or copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 website http://ucalgary.ca/gpe/_specializations.

15. Faculty Members/Research Interests
Research interests of faculty members and adjunct faculty can be found at: http://www.educ.ucalgary.ca/research/academic/homepages.html and from the Division office.

1. Degree: Doctor of Philosophy
School and Applied Child Psychology

2. Admission Requirements
In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the SACP PhD program include:

(a) A completed thesis-based Master's degree in School and Applied Child Psychology or equivalent from an approved university, with a minimum grade point average of 3.50 in the Master's program. If coursework from an applicant's Master's program is not equivalent to courses from the Master of Science in School and Applied Child Psychology at the University of Calgary, the student will be required to take additional courses within the doctoral program to ensure equivalent training but these prerequisite courses will need to be completed before the doctoral candidacy examination.

(b) A typed résumé and a concise rationale (500 words or less) for the application

(c) Two letters of reference

3. Application Deadline
On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply.

The deadline for the submission of complete applications to all programs is December 1 for September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:

Students admitted to the Doctoral program will be required to complete:

- a minimum of two (2) doctoral-level full-course equivalents (normally Applied Psychology 691, 731, and 732, and 795);
- a non-credit research seminar;
- a candidacy examination;
- a twelve-month (min. 1600 hours) full-time internship; and
- a dissertation

Students entering the program following completion of a Master's degree outside the program may be required to take additional Master's courses to ensure equivalency to the Master of Science program in School and Applied Child Psychology at the University of Calgary. A student may be deficient in no more than two full courses, which must be completed in the first year of Doctor of Philosophy studies.

Detailed information on core course requirements can be obtained from the Faculty of Education website.

Note: First year students are assigned an interim advisor who will assist with course selection.

6. Additional Requirements
Applied experience is an asset.

7. Credit for Undergraduate Courses
The Division does not normally accept undergraduate courses for credit toward graduate degrees.
8. **Time Limit**
The Doctor of Philosophy degree should be completed in four years. Maximum completion time allowed for the Doctor of Philosophy degree is six years.

9. **Supervisory Assignments**
An interim advisor is assigned to each first-year student in a thesis-based program. Students are responsible for initiating discussions with potential permanent supervisors and are expected to have finalized supervisory arrangements by their second annual registration.

10. **Required Examinations**
Candidacy examinations for the doctoral program both have written and oral components.

Information on examinations is provided on the Graduate Programs in Education website.

11. **Research Proposal Requirements**
Information on research proposals is available through the interim advisor/supervisor. Ethics approval is needed for all research projects (including dissertation) involving the use of human subjects before data collection begins. To initiate the ethics review, the researcher must submit a copy of the application (available on the Research Services website) to the Conjoint Faculties Research Ethics Board, c/o Associate Dean (Research), Faculty of Education.

12. **Special Registration Information**
None.

13. **Financial Assistance**
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships for September admission must submit their scholarship applications to the Graduate Programs in Education office by the preceding February 1.

The Division also provides assistance for students through teaching assistantships, graduate research scholarships and other Divisional scholarships. Application forms and deadline information for these awards can be obtained from the Division.

14. **Other Information**
For further information or for copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 website http://ucalgary.ca/gpe/specializations

15. **Faculty Members/Research Interests**
Research interests of faculty members and adjunct faculty can be found at: http://www.educ.ucalgary.ca/research/academic/homepages.html and from the Division office.

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1. **Degree:** Master of Science and Master of Education

2. **Admission Requirements**
In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the CP Master of Science program include:
(a) Normally, a minimum of three full-course equivalents in applied psychology and/or psychology. This must include:
   - Two undergraduate statistics courses (Note: For those who completed a psychology degree at the University of Calgary, Psychology 312 acts as an equivalent.)
   - Applied Psychology 419 (Communication Skills in Guidance and Counselling) or its equivalent (Applied Psychology 593/693 Communication Skills – Interpersonal and Verbal Facilitation)
   - A senior undergraduate psychology or applied psychology course in each of learning theory, developmental psychology, and personality theory
(b) A résumé and a concise rationale for the application (500 words or less)
(c) Two letters of reference.
(d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test) or 92 (Internet-based test) or a MELAB score of 82 or an IELTS score of 7.0.

3. **Application Deadline**
On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply.

The deadline for the submission of complete applications to all programs is December 1 for September admission.

4. **Advanced Credit**
The applicant must make advanced credit for undergraduate courses taken while enrolled in an undergraduate degree program and for courses taken to bring grade point average to a required level for admission. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. **Program/Course Requirements**
In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:
Students will be required to complete:
- Eight full course 600-level equivalents (including 500 hours of practicum experience equivalent to 1.5 full courses): Applied Psychology 603, 605, 607 or 611, 615, 617, 621, 623, 625, 627, 631, 640, 641 or 643, 691.04 and 691.05, 695.06, and one-half course elective.
  - a thesis (equivalent to one full course)
  - a non-credit research seminar

Course content addresses theory, research, and practice in the domains identified by the CCPA Standards for Accreditation of Counsellor Education Programs. Detailed information on core course requirements can be obtained from the Division website in the document Counselling Psychology Information Booklet and from the Faculty of Education Office of Graduate Programs. First year students are assigned an interim advisor who will assist with course selection.

6. **Additional Requirements**
Applied experience is an asset.

7. **Credit for Undergraduate Courses**
The Division does not normally accept undergraduate courses for credit toward graduate degrees.

8. **Time Limit**
The Master of Science requires two years of full-time study to complete. Maximum time allowed for completion of the Master of Science degree is four years.

9. **Supervisory Assignments**
An interim advisor is assigned to each first-year student in a thesis-based program. Students are responsible for initiating discussions with potential permanent supervisors and are expected to have finalized supervisory arrangements by their second annual registration.

10. **Required Examinations**
Comprehensive examinations for the Master of Education in Counselling Psychology program and candidacy examinations for the doctoral program both have written and oral components.

Information on examinations is provided on the Graduate Programs in Education website.

11. **Research Proposal Requirements**
Information on research proposals is available through the interim advisor/supervisor. Ethics approval is needed for all research projects involving the use of human subjects before data collection begins. To initiate the ethics review, the researcher must submit a copy of the application (available on the Research Services website) to the Conjoint Faculties Research Ethics Board, c/o Associate Dean (Research), Faculty of Education.

12. **Special Registration Information**
None.

13. **Financial Assistance**
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships for September admission must submit their scholarship applications to the Graduate Programs in Education office by the preceding February 1.

The Division also provides assistance for students through teaching assistantships, graduate research scholarships and other Divisional scholarships. Application forms and deadline information for these awards can be obtained from the Division.
14. Other Information
For further information or for copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 website http://ucalgary.ca/gpe/specializations

15. Faculty Members/Research Interests
Research interests of faculty members and adjunct faculty can be found at: http://www.educ.ucalgary.ca/research/academic/homepages.html and from the Division office.

1. Degree: Master of Science
School and Applied Child Psychology

2. Admission Requirements
In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the SACP Master of Science program include:
(a) Honours degree in Psychology (or equivalent), with a grade point average of 3.0 (equivalent to a B or 70% in many universities) over the courses taken during the last two years of study;
(b) A résumé and statement of research and professional interests including the specification of a prospective research supervisor from among current faculty;
(c) Two letters of reference;
(d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test) or 92 (Internet-based test) or a MELAB score of 82 or an IELTS score of 7.0.
(e) Prior to admission, the most promising applicants may be interviewed to evaluate their understanding of and motivation for entry into the field of school and applied child psychology

3. Application Deadline
On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply.
The deadline for the submission of complete applications to all programs is December 1 for September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:
Students will be required to complete:
• 15 half-courses (including a minimum of 600 practicum hours): Applied Psychology 603, 605, 607, 635, 650, 651, 652, 654, 656, 657, 658, 660, 674, 675, 676
• a thesis (equivalent to three half-courses)
• a non-credit research seminar

6. Additional Requirements
Applied experience is an asset.

7. Credit for Undergraduate Courses
The Division does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit
The Master of Science requires two years of full-time study to complete. Maximum completion time is four years.

9. Supervisory Assignments
An interim advisor is assigned to each first-year student in a thesis-based program. Students are responsible for initiating discussions with potential permanent supervisors and are expected to have finalized supervisory arrangements by their second annual registration.

10. Required Examinations
Information on examinations is provided on the Graduate Programs in Education website.

11. Research Proposal Requirements
Information on research proposals is available through the interim advisor/supervisor. Ethics approval is needed for all research projects (including thesis) involving the use of human subjects before data collection begins. To initiate the ethics review, the researcher must submit a copy of the application (available on the Research Services website) to the Conjoint Faculties Research Ethics Board, c/o Associate Dean (Research), Faculty of Education.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships for September admission must submit their scholarship applications to the Graduate Programs in Education office by the preceding February 1.
The Division also provides assistance for students through teaching assistantships, graduate research scholarships and other Divisional scholarships. Application forms and deadline information for these awards can be obtained from the Division.

14. Other Information
For further information or for copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 website http://ucalgary.ca/gpe/specializations

15. Faculty Members/Research Interests
Research interests of faculty members and adjunct faculty can be found at: http://www.educ.ucalgary.ca/research/academic/homepages.html and from the Division office.

1. Degree: Master of Education
Counselling Psychology

2. Admission Requirements
Please note that we are not admitting students to the M.Ed. in Counselling Psychology this year.
In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the CP Master of Education program include:
(a) Normally, a minimum of three full-course equivalents in applied psychology and/or psychology. This must include:
• Two undergraduate statistics courses
(Note: For those who completed a psychology degree at the University of Calgary, PSYC 312 acts as an equivalent.)
• Applied Psychology 419 (Communication Skills in Guidance and Counselling) or its equivalent
Applied Psychology 593/693 Communication Skills – Interpersonal and Verbal Facilitation
• A senior undergraduate psychology or applied psychology course in each of learning theory, developmental psychology, and personality theory
(b) A résumé and a concise rationale for the application (500 words or less)
(c) Two letters of reference.
(d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test) or 92 (Internet-based test) or a MELAB score of 82 or an IELTS score of 7.0.

3. Application Deadline
On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply.
The deadline for the submission of complete applications to all programs is December 1 for September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:
(Please note that we are not admitting students to the M.Ed. in Counselling Psychology this year). Students will be required to
complete a course-based program, which includes:

- eight full-course 600 level equivalents (including 500 hours of practicum experience (equivalent to 1.5 full courses): Applied Psychology 603, 605, 615, 617, 621, 623, 625, 627, 631, 640, 641 or 643, 691.04 and 691.05, 695.06, and two half-course electives.
- written and oral comprehensive examinations upon the completion of coursework.

Course content addresses theory, research, and practice in the domains identified by the CCPA Standards for Accreditation of Counsellor Education Programs. Detailed information on core course requirements can be obtained from the Division website in the document Counselling Psychology Information Booklet and from the Faculty of Education Office of Graduate Programs. First-year students are assigned an interim advisor who will assist with course selection.

6. Additional Requirements

Applied experience is an asset.

7. Credit for Undergraduate Courses

The Division does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit

The Master of Education (please note that we are not admitting students to the M.Ed. in Counselling Psychology this year) can be completed in two years of full-time study but students may take up to six years to complete the degree on a part-time basis.

9. Supervisory Assignments

An interim advisor is assigned to each first-year student in a thesis-based program. Students are responsible for initiating discussions with potential permanent supervisors and are expected to have finalized supervisory arrangements by their second annual registration.

10. Required Examinations

Comprehensive examinations for the Master of Education in Counselling Psychology program and candidacy examinations for the doctoral program both have written and oral components.

Information on examinations is provided on the Graduate Programs in Education website.

11. Research Proposal Requirements

Information on research proposals is available through the interim advisor/supervisor. Ethics approval is needed for all research projects involving the use of human subjects before data collection begins. To initiate the ethics review, the researcher must submit a copy of the application (available on the Research Services website) to the Conjoint Faculties Research Ethics Board, c/o Associate Dean (Research), Faculty of Education.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships for September admission must submit their scholarship applications to the Graduate Programs in Education office by the preceding February 1.

The Division also provides assistance for students through teaching assistantships, graduate research scholarships and other Divisional scholarships. Application forms and deadline information for these awards can be obtained from the Division.

14. Other Information

For further information or for copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 website http://ucalgary.ca/gpe/specializations

15. Faculty Members/Research Interests

Research interests of faculty members and adjunct faculty can be found at: http://www.educ.ucalgary.ca/research/academic/homepages.html and from the Division office.

1. Degree: Master of Counselling

Counselling Psychology

2. Admission Requirements

In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the CP Master of Counselling program include:

(a) at least three half-courses in psychology or educational psychology (including one course each in human development and learning). In addition, applicants are required to have a half-course in counselling skill
(b) a résumé and a concise rationale for the application (500 words or less)
(c) Paid employment or volunteer work in counselling-related and research-related roles will be an asset.

3. Application Deadline

On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply.

The deadline for the submission of complete applications to all programs is December 1 for September admission.

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements

In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:

The Master of Counselling Program is offered through a distributed learning mode of delivery. It consists of twelve half-courses, 10 of which are compulsory. The compulsory courses required by all students in the Campus Alberta Applied Psychology and Applied Psychology MC degree are listed in the program area below. More complete course descriptions and electives are provided on the Educational Studies in Psychology website.

Master of Counselling – APSY

Students admitted to the MC Program on or after September 2011 will be required to complete:

APSY: MC required Courses

- Applied Psychology 602: Counselling theories and professional practice
- Applied Psychology 603: Professional Ethics in Applied Psychology
- Applied Psychology 605: Research Design and Statistics in Applied Psychology
- Applied Psychology 616: Assessment theory and practices
- Applied Psychology 622: Developing and sustaining a working alliance with clients
- Applied Psychology 638: Counselling interventions for client change
- Applied Psychology 642: Counselling Practicum I
- Applied Psychology 644: Counselling Practicum II
- Applied Psychology 670: Final Project Portfolio Course

Master of Counselling – CAAP

Students admitted to the MC Program before September 2011 need:

- Campus Alberta Applied Psychology 601: Theories of Counselling and Client Change
- Campus Alberta Applied Psychology 603: Professional Ethics
- Campus Alberta Applied Psychology 605: Developing a Working Alliance
- Campus Alberta Applied Psychology 607: Equity and Diversity Issues in Counselling
- Campus Alberta Applied Psychology 611: General Counselling Practicum
- Campus Alberta Applied Psychology 613: Assessment
- Campus Alberta Applied Psychology 615: Intervening to Facilitate Client Change
- Campus Alberta Applied Psychology 617: Methods of Inquiry
- Campus Alberta Applied Psychology 619: Specialized Practicum
- Campus Alberta Applied Psychology 693.99: Final Project Portfolio Course
6. Additional Requirements
Applied experience is an asset. Applicants to the Master of Counselling and Master of Education in School and Applied Child Psychology should have reasonable computer literacy because portions of the programs are delivered on-line.

7. Credit for Undergraduate Courses
The Division does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit
The Master of Counselling can be completed in three years of full-time study, but students may take up to six years to complete the degree on a part-time basis.

9. Supervisory Assignments
An academic advisor is assigned to students in the course-based Master of Counselling.

10. Required Examinations
Distributed learning programs (Master of Education in School and Applied Child Psychology and Master of Counselling) have a capstone exit procedure. Information on examinations is provided on the Graduate Programs in Education website.

11. Research Proposal Requirements
Not required.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships for September admission must submit their scholarship applications to the Graduate Programs in Education office by the preceding February 1.

The Division also provides assistance for students through teaching assistantships, graduate research scholarships and other Divisional scholarships. Application forms and deadline information for these awards can be obtained from the Division.

14. Other Information
For further information or for copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 website http://ucalgary.ca/gpe/specializations

15. Faculty Members/Research Interests
Research interests of faculty members and adjunct faculty can be found at: http://www.educ.ucalgary.ca/research/academic/homepages.html and from the Division office.

Note: Graduate courses within the Division of Applied Psychology can be taken only with consent of the Division of Applied Psychology and in specific cases additional requirements may be necessary (see below).

1. Degree: Master of Education
School and Applied Child Psychology

2. Admission Requirements
In addition to Faculties of Graduate Studies and Education requirements, entry requirements for the SACP Master of Education program include:
(a) A completed bachelor's degree in Education or Psychology with a grade point average of 3.0 (equivalent to a B or 70% in many universities) over the courses taken during the last two years of study
(b) A minimum of 30 credit units (10 half credit courses) completed in psychology is required prior to application
(c) A resume and a concise rationale for the application (500 words or less).
(d) Two letters of reference
(e) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test) or 92 (Internet-based test) or an MELAB score of 82 or an IELTS score of 7.0.
(f) Prior to admission, the most promising applicants may be interviewed to evaluate their understanding of and motivation for entry into the field of school and applied child psychology

3. Application Deadline
On-line applications to all Educational Studies in Psychology programs may be accessed through the following link: http://ucalgary.ca/gpe/StepstoApply

The deadline for the submission of complete applications to all programs is December 1 for September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Education requirements, the degree programs require the following:
- The Master of Education will be offered through a distributed learning mode of delivery. Students will be required to complete a course-based program which includes:
  - 18 half-courses (including a minimum of 600 practicum hours); Applied Psychology 603, 605, 607, 635, 650, 651, 652, 654, 656, 657, 658, 660, 674, 675, 676, 684, Campus Alberta Applied Psychology 601, and an Applied Psychology/Campus Alberta Applied Psychology elective.
  - A portfolio exit project. 684 (listed above) is the students’ capstone course and is evaluated as an exit portfolio. Applied Psychology 684 must be taken as the final course (or concurrently with final courses) prior to the internship.
  - A 1,200 hour internship (Applied Psychology 698 A/B - equivalent to 2 half-courses).

Note: Detailed information on core course requirements for each specialization can be obtained from the Faculty of Education website.

6. Additional Requirements
Applied experience is an asset. Applicants to the Master of Counselling and Master of Education in School and Applied Child Psychology should have reasonable computer literacy because portions of the programs are delivered on-line.

7. Credit for Undergraduate Courses
The Division does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit
The Master of Education (Distributed Learning) can be completed in three years of full-time study but students may take up to six years to complete the degree on a part-time basis.

9. Supervisory Assignments
An academic advisor is assigned to students in the course-based Master of Counselling and Master of Education programs.

10. Required Examinations
Distributed learning programs (Master of Education in School and Applied Child Psychology and Master of Counselling) have a capstone exit procedure. Information on examinations is provided on the Graduate Programs in Education website.

11. Research Proposal Requirements
Not required.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships for September admission must submit their scholarship applications to the Graduate Programs in Education office by the preceding February 1.

The Division also provides assistance for students through teaching assistantships, graduate research scholarships and other Divisional scholarships. Application forms and deadline information for these awards can be obtained from the Division.

14. Other Information
For further information or for copies of the Division brochure, write to the Graduate Programs in Education Office, Faculty of Education, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada
Graduate Programs in Education offers Doctor of Philosophy (PhD), Doctor of Education (EdD), Master of Arts (MA), Master of Science (MSc), and Master of Education (MEd) degrees in five areas of specialization, as noted below. The Doctor of Philosophy degree program is normally intended to prepare scholars for careers in research and teaching. The Doctor of Education degree program is normally intended for practising professionals in education-related situations. The Master of Arts and Master of Science are equivalent thesis-based research degrees that prepare students for further research. The Master of Education is a course-based professional degree.

Curriculum, Teaching and Learning

Graduate students will have opportunities to understand how interpretive disciplines in curriculum and emergent theories of learning offer meaningful and potentially transforming ways of thinking about schooling, knowledge, research, teaching/learning, and the nature of pedagogical relationships. Curriculum and Learning encompass issues of content, context, and teaching in both formal and non-formal educational settings. Students can explore contemporary themes of curriculum and learning, including issues of globalization, gender, culture, power, traditions, wisdom, ecology in education, and the ideas and practices of social justice, examined from social, cultural, historical, political, discursive, ecological and other interpretive perspectives. (PhD, EdD, MSc, MA, MEd)

Educational Contexts

(not admitting to this specialization)

Educational Leadership

This specialization draws upon the social sciences and humanities to prepare researchers and practitioners for the analysis and resolution of issues and problems related to educational policy and the direction and management of schools, school systems, other institutions, and government bodies concerned with public and private education. This specialization prepares graduates for administrative and research-related careers with an understanding of organizational change in the field of educational leadership. (PhD, EdD, MA, MEd)

Educational Technology

This specialization is addressed to two audiences:
- a) Teachers who are interested in the application of technology in the classroom or who are interested in technology leadership positions;
- b) Those who are interested in instructional development in settings outside elementary/secondary schools, e.g., instructional developers in colleges, institutes of technology and universities, military/industrial trainees, health educators, and private training consultants.

Students in this specialization have the opportunity to investigate a broad spectrum of instructional design and development techniques as they apply to newer technologies and to explore new directions in instructional design and development as they emerge in the literature. (PhD, EdD, MA, MEd)

Higher Education Leadership

(not admitting to this specialization)

Interpretive Studies in Education

(not admitting to this specialization)

Teaching Languages

Contemporary society is marked by linguistic and cultural diversity. Educational Studies in Language and Diversity at the graduate level prepares students to understand and conduct research on various dimensions of linguistic and cultural diversity, especially as they relate to the acquisition, use, teaching, and learning of languages. This specialization is open to applicants from a broad array of regions/countries. This program will be of interest to prospective educators and researchers in the areas of English as an additional language (EAL), English as a second language (ESL), bilingual education, French immersion, Education francophone, core French, and other languages, including Aboriginal languages, Spanish, Mandarin and Japanese. (PhD, EdD, MA, MEd)

Second Language Teaching

(not admitting to this specialization)

Teaching English as a Second Language (TESL)

(not admitting to this specialization)

Workplace and Adult Learning

This specialization is informed by a rich heritage rooted in a commitment to human, community and social development. As a hub of interdisciplinarity, the focus of graduate studies within this specialization is on adult learning and adult education. Our graduate students draw from multiple and diverse contexts and interest areas, which include: traditional post-secondary and continuing education; business and industry; NGOs; community development and international organizations. (PhD, EdD, MA, MEd)

Graduate Programs Online

Graduate Programs in Education offers online graduate programs via the web and other multi-media components to local, regional, national, and international communities. Programs normally lead to the Master of Education (MEd) in Curriculum, Teaching and Learning; Educational Leadership; Educational Technology; Teaching Languages; and Workplace and Adult Learning. The thesis-based Doctor of Education (EdD) in the specializations of Educational Leadership (K-12); Educational Technology; and Workplace and Adult Learning; are offered in direct response to the needs of working professionals in a variety of settings, including administrators, program directors, and deans in colleges and institutes of technology.

Contact: gder@ucalgary.ca or (403) 220-5675 or toll free in Canada (877) 623-0292.

Doctor of Philosophy (PhD) – on campus

2. Admission Requirements

In addition to the Faculty of Graduate Studies, Graduate Programs in Education requires:
- a) A thesis-based Master’s degree in an appropriate field. Outstanding applicants holding Master’s degrees without thesis may be considered;
- b) A minimum grade point average of 3.50 on a four-point scale in a Master’s degree program;
- c) A written statement indicating the applicant’s reasons for wishing to pursue a graduate program;
- d) Where appropriate, candidates will be expected to have, or to obtain, relevant practical experience in their area of specialization;
- e) For applicants required to prove proficiency in English, a TOEFL score of 580 (written test), 93 (Internet-based test), a MELAB score of 82 or an IELTS score of 7.0;
- f) Two reference letters.

Admission Portfolio

Applicants to the Doctor of Philosophy program are encouraged to submit an Admission Portfolio containing examples of their work. The purpose of the Admission Portfolio is to give applicants the opportunity to provide additional documentation that demonstrates their suitability and qualification for doctoral studies. The Admission Portfolio is particularly relevant for program applicants who do not hold a thesis-based Master’s degree.

The Doctoral Admission Portfolios must include a Table of Contents and an Executive Summary that outlines the contents of the Portfolio.

The Doctoral Admission Portfolio may contain the following:
- a) Thesis (if applicable);
- b) Reports;
- c) Research grants or scholarships;
- d) Articles;
Program Descriptions

8. Time Limit
Expected completion time for full-time students is four years with a maximum completion time of six years.

9. Supervisory Assignments
A supervisor is normally appointed at the time of admission.

10. Required Examinations
Written Candidacy Process for PhD:
A written paper will be prepared by the student to demonstrate her/his knowledge of the Field of Study and preparedness to conduct research in this field. The paper will be a response to one written question normally selected by the student from two or three questions prepared by the supervisor with the assistance of the supervisory committee members. The questions are to take into consideration a list of readings agreed to by the supervisory committee and the student as defining the student’s Field of Study. These questions must be approved by Graduate Programs in Education Associate Dean or designate before being presented to the student.

On the date assigned to begin the Written Paper, the student may pick up the questions from the Graduate Secretary. The student then has twenty-eight days to prepare, independently, the paper. The paper normally will be twenty-five to forty double-spaced pages in length, exclusive of references and should use the standard format normally used within a given Area of Specialization. The student will provide a copy of the question and the paper to each member of the examining committee at least two weeks in advance of the Oral Examination.

11. Research Proposal Requirements
Questions on research proposals are not examined during the oral candidacy examination. Thesis proposals must be approved before the candidacy examination.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to Graduate Program in Education by February 1.

14. Other Information
None.

15. Faculty Members/Research Interests
Current faculty members and their areas of interest can be found at http://ucalgary.ca/gpe/faculty-members.

Doctor of Education (EdD) - blended/online

2. Admission Requirements
In addition to the Faculty of Graduate Studies, Graduate Programs in Education requires:

a) A course or thesis-based Master’s degree in an appropriate field;

b) A minimum grade point average of 3.50 on a four-point scale in a Master’s degree program;

c) A written statement indicating the applicant's reasons for wishing to pursue a graduate program;

d) Candidates will be expected to have, or obtain, relevant practical experience in their area of specialization;

e) For applicants required to prove proficiency in English, a TOEFL score of 580 (written test), 93 (Internet-based test), a MELAB score of 82 or an IELTS score of 7.0;

f) Two reference letters.

Admission Portfolio
Applicants to the Doctor of Education program are encouraged to submit an Admission Portfolio containing examples of their work. The purpose of the Admission Portfolio is to give applicants the opportunity to provide additional documentation that demonstrates their suitability and qualification for doctoral studies. The Admission Portfolio is particularly relevant for program applicants who do not hold a thesis-based Master’s degree.

The Doctoral Admission Portfolios must include a Table of Contents and an Executive Summary that outlines the contents of the Portfolio.

The Doctoral Admission Portfolio may contain the following:

a) Thesis (if applicable);

b) Reports;

c) Research grants or scholarships;

d) Articles;

e) Curriculum documents;

f) Non-print materials, e.g., multimedia;

g) Relevant prior learning (see below);

h) Personal statement documenting research and professional skills and interests.

Relevant Prior Learning Considerations:

a) Personal continuing education/training;

b) Results in these continuing education efforts;

c) Experience in a field related to the aspired degree;

d) Management of people, resources, finances, situations;

e) Increasing or varying responsible positions in organizations related to the aspired degree;

f) Work-related products, e.g. reports, programs of learning or training, handbooks, videos, manuals, workshops, seminars;
Program Descriptions

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Students applying for scholarships must submit their applications to Graduate Programs in Education by February 1.

14. Other Information.
None.

15. Faculty Members/Research Interests
Current faculty members and their areas of interest can be found at http://ucalgary.ca/gpe/faculty-members.

Master of Arts in Education or Master of Science in Education – on campus

2. Admission Requirements
In addition to the Faculty of Graduate Studies, Graduate Programs in Education requires:

a) A written statement indicating the applicant’s reasons for wishing to pursue a graduate program;

b) For students required to prove proficiency in English, a TOEFL score of 580 (written test) or 237 (computer-based test), or 93 (Internet-based test), a MELAB score of 82 or an IELTS score of 7.0;

c) Two reference letters.

3. Application Deadline
December 1 for a July or September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma, or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
In addition to the requirements of the Faculty of Graduate Studies, Graduate Programs in Education requires:

a) A minimum of six full courses;

b) One full-course equivalent in research methods;

c) Two reference letters.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Graduate Programs in Education does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit
Expected completion time for full-time students is four years for thesis-based Master’s programs. Maximum completion time is four years for thesis-based Master’s programs.

9. Supervisory Assignments
An interim supervisor is normally appointed at the time of admission.

10. Required Examinations
Final thesis oral examination.

11. Research Proposal Requirements
Questions on research proposals are not examined during the oral examination.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

14. Other Information.
None.

15. Faculty Members/Research Interests
Current faculty members and their areas of interest can be found at http://ucalgary.ca/gpe/faculty-members.

Master of Education – blended/online

2. Admission Requirements
In addition to the Faculty of Graduate Studies, Med Graduate Programs in Education requires:

a) A written statement indicating the applicant’s reasons for wishing to pursue a graduate program in Graduate Programs in Education;

b) For students required to prove proficiency in English, a TOEFL score of 580 (written test) or 237 (computer-based test), or 93 (Internet-based test), a MELAB score of 82 or an IELTS score of 7.0;

c) Two reference letters.

3. Application Deadline
February 1 for a July or September admission.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma, or for courses taken to bring grade point average to a required level for admission.

5. Program/Course Requirements
This degree is done a full-time or part-time basis in a blended/online environment:

a) A minimum of six full courses;

b) One full-course equivalent in research methods;
c) Two full-course equivalents in the student's area of specialization;
d) Additional graduate courses or seminars as determined by the supervisor in consultation with the student and approved by the Associate Dean of Graduate Programs in Education.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Graduate Programs in Education does not normally accept undergraduate courses for credit toward graduate degrees.

8. Time Limit
Expected completion time is two years. Maximum completion time is six years for a course-based Master’s program.

9. Supervisory Assignments
An interim supervisor is normally appointed at the time of admission.

10. Required Examinations
As per course requirements.

11. Research Proposal Requirements
N/A.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to Graduate Programs in Education by February 1.

14. Other Information
None.

15. Faculty Members/Research Interests
Current faculty members and their areas of interest can be found at http://ucalgary.ca/gpe/faculty-members.

Post Degree Continuous Learning Graduate Diplomas and Graduate Certificates
Eligible graduate students may progress through a three-stage laddering structure: graduate certificates, graduate diplomas, and the Master of Education degree program. That is, it may be possible for students to “ladder” with full academic and fee credit from a two full-course equivalent graduate certificate into a graduate diploma requiring an additional two full-course equivalents, and from there into a Master of Education program requiring another two full-course equivalents.

2. Admission Requirements
In addition to the Faculty of Graduate Studies, the Office of Graduate Programs in Education requires:

a) A written statement indicating the applicant’s reasons for wishing to pursue a graduate program in Education.
b) For students required to prove proficiency in English, a TOEFL score of 580 (written test) or 237 (computer-based test), or 93 (Internet-based test), a MELAB score of 82 or an IELTS score of 7.0.

3. Application Deadline
February 1 for a July or September admission.

Engineering Programs

ENGG

Contact Information
Location: ENC202
Faculty number: 403.220.5738
Fax: 403.284.3697
E-mail address: schulich@ucalgary.ca
Web page URL: http://wcm2.ucalgary.ca/schulich/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
Master of Engineering (MEng), thesis and course-based

Areas: Chemical and Petroleum, Civil, Electrical and Computer, Geomatics, and Mechanical and Manufacturing Engineering.

In addition, the Schulich School of Engineering offers PhD, MSc, and MEng degrees with interdisciplinary specializations in Environmental Engineering and Energy & Environment.

The University of Calgary and the University of Alberta offer a joint Biomedical Engineering Program. Further information on all programs and specializations is provided under individual separate listings in this Calendar. Master's thesis and doctoral Graduate Students are normally admitted as full-time students. The Head of the Department or designate may however, approve requests for registration as part-time or transfer from a full-time to a part-time status.

2. Admission Requirements
The Schulich School of Engineering has established common minimum student admission requirements for all its graduate programs, with the exception of students with project management background entering the Manufacturing Engineering program. Departments and graduate programs may have additional requirements over and above those of the Schulich School of Engineering. In addition to the Faculty of Graduate Studies requirements, the Schulich School of Engineering minimum requirements are as follows:

Master's Programs

a) BSc degree or equivalent
b) A minimum admission grade point average of 3.00 on a four-point scale or equivalent.
c) Holders of BSc or equivalent degrees in Science, Medicine, Kinesiology or other Engineering, if accepted, may be required to take additional senior undergraduate engineering courses. These courses will not be counted for credit toward their graduate program. Holders of Bachelor's degrees from disciplines other than Engineering, Science, Medicine or Kinesiology are required to complete a minimum of 10 make-up undergraduate engineering half courses with a minimum GPA of 3.00 on a four-point scale before admission.
d) Two reference letters

In exceptional circumstances, students who do not meet the entrance requirements (but have BSc degrees in the same or equivalent Engineering discipline and a GPA of at least 2.70) may be considered for admission after upgrading requirements have been met. These include a minimum of 6 make-up half courses, or 3 make-up half courses if they have acceptable industrial experience, with a minimum grade of 3.00 on a four-point scale in each course. At least 4 or 2 of these half courses, respectively, must be graduate level courses.

Doctor of Philosophy

a) MSc degree, or transfer from MSc program, or, in exceptional cases, BSc degree or equivalent.
b) A minimum admission grade point average of 3.50 on a four-point scale or equivalent.
c) Transfer from MSc to PhD program is allowed only after the successful completion of all courses required for the MSc degree with a minimum GPA of 3.50.
d) Two reference letters

Holders of MSc or equivalent degrees in Science, Medicine, Kinesiology or other Engineering, if accepted, may be required to take additional senior undergraduate Engineering courses. These courses will not count for credit toward their doctoral program.

3. Application Deadline
See departmental, program and specialization sections.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process, in consultation with the proposed supervisor and the Graduate Director. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission. Students who receive advanced course credit when admitted to a Master's program may be able to accelerate the completion of their degree.

5. Program/Course Requirements
The Schulich School of Engineering has established common minimum program/course requirements for all its graduate pro-
grams. Departments and graduate programs may have additional requirements over and above those of the Schulich School of Engineering.

In addition to Faculty of Graduate Studies requirements, the Schulich School of Engineering minimum requirements are as follows:

**Master of Engineering (course-based)**
A minimum of ten half courses, of which at least six must be graduate courses.

**Master of Engineering (thesis-based)**
A minimum of four graduate half courses.

**Master of Science**
A minimum of four graduate half courses.

**Doctor of Philosophy**
A minimum of two graduate half courses beyond the Master of Science course requirements. For students who transfer from an MSc program, 6 graduate half courses beyond the BSc, or equivalent, degree.

**All Degree Programs**
After consultation with the supervisor and the Graduate Director, courses outside the Department or the University may be approved towards the degree requirements.

6. **Additional Requirements**
None.

7. **Credit for Undergraduate Courses**
See Section 5.

8. **Time Limit**
Typical completion times are two years for full-time students in a Master’s program and three to four years in a doctoral program. The Master of Engineering (course-based) can be completed in one year. Maximum completion times are four years for a Master of Science and a Master of Engineering (thesis-based), and six years for a Master of Engineering (course-based) or doctoral program.

9. **Supervisory Assignments**
Supervisors and supervisory committees are assigned according to the Faculty of Graduate Studies Handbook of Supervision and Examination and are approved by the Department Head or the Graduate Director.

10. **Required Examinations**
**MEng (course-based) Comprehensive Examination**
None.

**MEng (thesis-based) MSc Final Oral Examination**
The thesis examination is oral. In addition to Faculty of Graduate Studies regulations, the Schulich School of Engineering requires the examining committee to consist of a minimum of four voting members: the supervisor, one member external to the student’s department of study, and two other members. The examination is chaired by a neutral chair (non-voting), proposed by the Department Head or Graduate Director, from outside the student’s department. The examining committee must be approved by the Faculty of Graduate Studies.

The student shall make a public twenty-minute presentation of his/her thesis research, normally immediately before the oral examination. Examining committee members should attend this presentation but should refrain from asking questions. The maximum allowable two-hour examination period does not include the time spent on student presentation.

**Doctoral Candidacy Examinations**
The candidacy examination is oral. In addition to Faculty of Graduate Studies regulations, the Schulich School of Engineering requires the examining committee to consist of a minimum of five voting members: the supervisory committee members and two additional members (one of them external to the program). The examination is chaired by a Neutral Chair, who is recommended by the Department Head or Graduate Director. The examining committee must be approved by the Faculty of Graduate Studies.

The student’s background knowledge in his/her field of engineering and in-depth knowledge in his/her chosen research specialization is examined. At the discretion of the department, (i) the candidacy examination may have a written (minimum three hours) component, as well, given no more than seven days before the oral defence; and (ii) the student may make a presentation at the beginning of the oral candidacy examination. Questions on the research proposal will be included in the oral candidacy examination, unless otherwise specified under the individual Engineering Program entry.

**Doctoral Final Oral Examination**
The thesis defence examination is oral. The examining committee consists of a minimum of five voting members: the supervisory committee members, one member outside the student’s department of study, and one member from outside the University of Calgary. The examination is chaired by a neutral chair (non-voting), proposed by the Department Head or Graduate Director, from outside the department. The examining committee must be approved by the Faculty of Graduate Studies.

The student shall make a public twenty-minute presentation of his/her thesis research, normally immediately before the oral examination. Examining committee members should attend this presentation but should refrain from asking questions during the presentation. The maximum allowable two-hour examination period does not include the time spent on student presentation. Thesis oral examinations are open.

11. **Research Proposal Requirements**
See departmental, program and specialization sections.

12. **Special Registration Information**
None.

13. **Financial Assistance**
Candidates are typically admitted either self-funded or with financial support provided by an interested supervisor or the department. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships must submit their applications to the Department by February 1.

14. **Other Information**
Students enrolled in any of the engineering graduate programs may opt, in addition to their normal required course load, to undertake an international project outside Canada. The duration of the project should be between 4 and 6 months. Upon successful completion (on a credit/fail basis) of Engineering 689, the statement “International Graduate Internship Project” will appear on the parchment. The course is not repeatable for credit.

15. **Faculty Members/Research Interests**
See departmental, program and specialization sections.

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**Engineering, Chemical and Petroleum ENCH**

**Contact Information**
Location: Schulich School of Engineering, Room B202
Phone number: 403.220.4802
Fax number: 403.284.4852
E-mail address: chemandpetenggrad@ucalgary.ca
Web page URL: http://www.eng.ucalgary.ca/Chemical/

**1. Degrees and Specializations Offered**
Degrees:
- Doctor of Philosophy (PhD)
- Master of Science (MSc), thesis-based
- Master of Engineering (MEng), thesis-based and course-based

The Department offers specializations in Chemical Engineering, Petroleum Engineering, Environmental Engineering (Interdisciplinary), Energy and Environment (Interdisciplinary) and Biomedical Engineering. The Master of Engineering degree is also offered with specialization in Petroleum Reservoir Engineering, Petroleum Exploration Engineering and Reservoir Characterization (Interdisciplinary). For further information on the interdisciplinary specializations, see the separate listings in this Calendar.

The Universities of Calgary and Alberta offer a joint Biomedical Engineering Graduate Program. Further information can be obtained from the separate listing in this Calendar.

For registration status of thesis-based graduate students, see “Engineering Programs”.

**2. Admission Requirements**
In addition to the requirements of the Faculty of Graduate Studies and the Schulich
School of Engineering, the Department requires:

**Master of Engineering with Specialization in Petroleum Reservoir Engineering**
- A Bachelor's degree in Chemical, Oil and Gas, or Petroleum Engineering

Exceptionally, students with a Bachelor's degree in another branch of Engineering and substantial experience in the petroleum industry may be considered for admission.

**Doctor of Philosophy**
See "Engineering Programs".

### 3. Application Deadline

Deadlines for submission of complete applications for students with international transcripts:
- March 15 for September admission
- July 15 for January admission
- November 15 for May admission

Deadlines for submission of complete applications for students with Canadian and US transcripts:
- July 15 for September admission
- November 15 for January admission
- March 15 for May admission

### 4. Advanced Credit

See "Engineering Programs".

### 5. Program/Course Requirements

See "Engineering Programs".

### 6. Additional Requirements

The Department has established the following two graduate courses as required courses for the Master of Science and Doctoral degrees:
- Experimental Design and Error Analysis (Chemical Engineering 701)
- Advanced Mathematical Methods in Engineering (Chemical Engineering 703)

Regardless of their specialization, all Master of Science students must take at least one of these two required courses while all doctoral students must take both required courses.

In addition, core courses have been established for the following specializations:
- Chemical Engineering specialization: Chemical Engineering 613, 623, 625, 631 and 633
- Petroleum Engineering specialization: Chemical Engineering 621, 629, 647, 657 and 677
- Biomedical Engineering specialization: Chemical Engineering 613, 623, 625, 631 and 633

All Master of Science students in the Chemical Engineering and Petroleum Engineering specializations must complete at least one of the core courses of their specialization and all doctoral students must complete at least two of the core courses of their specialization. Requirements for other specializations are listed under the corresponding sections.

All Master of Science and Doctoral students (Chemical, Petroleum, and Energy & Environment specializations) are required to register and participate in the Research Seminar course (Chemical Engineering 601) for each of the first two terms of their degree program. Each student (Chemical, Petroleum, and Energy & Environment specializations) must also present one research seminar in Chemical Engineering 601.

All Master of Science and Doctoral students (Biomedical Engineering specialization) are required to register and participate in the Research Seminar course (Chemical Engineering 601) in one Fall Term and the Biomedical Engineering equivalent (Biomedical Engineering 607) in one Winter Term usually during the first year of their degree program. Each student (Biomedical Engineering specialization) must present one research seminar in Biomedical Engineering 607.

For more details, students must refer to the guidelines for the Research Seminar course. Requirements for other specializations are listed under the corresponding sections.

### 7. Credit for Undergraduate Courses

Not applicable.

### 8. Time Limit

See "Engineering Programs".

### 9. Supervisory Assignments

All students are required to have a supervisor before the second annual registration. For students in the Master of Science and Doctor of Philosophy degree programs, a supervisor is normally appointed at the time of admission.

### 10. Required Examinations

All final thesis oral examinations involve a public seminar/presentation before the oral examination. PhD candidacy examination will not involve questions on the research proposal but will include questions on background knowledge needed to carry out the proposed research. See "Engineering Programs".

### 11. Research Proposal Requirements

**Doctor of Philosophy**
A research proposal must be submitted to and approved by the supervisory committee before the candidacy examination.

**Master's Programs**
See "Engineering Programs".

### 12. Special Registration Information

None.

### 13. Financial Assistance

See "Engineering Programs".

### 14. Other Information

See "Engineering Programs".

### 15. Faculty Members/Research Interests

The current research interests of the academic staff can be found at http://www.eng.ucalgary.ca/ENCH/nodes/73, or from the Department.

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**Engineering, Civil ENCI**

**Contact Information**
Location: Schulich School of Engineering, Room F262
Faculty number: 403.220.5821
Fax: 403.282.7026
E-mail address: civgrad@ucalgary.ca
Web page URL: http://www.schulich.ucalgary.ca/civil/

### 1. Degrees and Specializations Offered

**Doctor of Philosophy (PhD)**
- Master of Science (MSc), thesis-based
- Master of Engineering (MEng) thesis-based and course-based

**Areas of Study:**
- Civil Engineering
- Biomedical Engineering
- Energy and Environment (Interdisciplinary)
- Environmental Engineering (Interdisciplinary)

Specializations include:
- Avalanche Mechanics
- Biomechanics
- Bituminous Materials
- Geotechnical Engineering
- Materials Engineering
- Project Management
- Structures & Solid Mechanics
- Transportation Engineering
- Water Resources

### 2. Admission Requirements

**Master's Programs**
See "Engineering Programs".

**Doctor of Philosophy**
See "Engineering Programs".

**Project Management Specialization**
In addition to the "Engineering Program" degree requirements, a minimum of five years industrial experience, except in thesis-based degrees.

### 3. Application Deadline

Deadlines for submission of complete applications:
- Canadian and Permanent Resident Applications
  - May 1 for September admission
  - September 1 for January admission
  - January 1 for May admission
- International Admissions
  - April 1 for September admission
  - August 1 for January admission
  - December 1 for May admission

### 4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission. Successful completion of "make-up" work does not guarantee admission. It is recommended that applicants discuss this option with the Departmental Graduate Student Advisor before taking any courses.
5. Program/Course Requirements

Note: If the student does not consult the supervisor before selecting courses, Department approval may be withheld.

In addition to Faculty of Graduate Studies and the Schulich School of Engineering requirements, the Department normally requires:

Master of Science
a) A minimum of four and a maximum of eight half courses
b) Research and thesis work as major components of the program

Master of Engineering (thesis-based)
1) Five to twelve half courses
b) A thesis related to original analysis and/or design

Master of Engineering (course-based)
1) Ten to twelve half courses

Doctor of Philosophy
a) A minimum of six half courses beyond the baccalaureate
b) A minimum of two and a maximum of six half courses beyond the Master's degree
c) A detailed research proposal
d) A candidacy exam which has both a written and oral component. The written component will be a four hour open book exam usually held a week prior to the oral exam.

6. Additional Requirements

All full-time Master of Science and doctoral students, except for those registered in Environmental Engineering 601 or Biomedical Engineering 605 or 607, are required to register and participate in the Research Seminar course Civil Engineering 601.

Please note: These seminars are offered multiple times on different research topics and as such, Master of Science students are required to take Civil Engineering 601 two times and doctoral students three times while in program.

All graduate students who require access to Civil Engineering laboratories are required to complete a Workplace Hazardous Materials Information System (WHMIS) course and other required safety training courses before gaining access to the laboratories.

7. Credit for Undergraduate Courses

Not more than two of the half courses required in the thesis-based programs and not more than four of the half courses taken in the MEng program may be taken at the 500 level.

8. Time Limit

See "Engineering Programs".

9. Supervisory Assignments

See “Supervisors/Advisors” in the General Regulations section of this calendar.

10. Required Examinations

See “Engineering Programs”.

11. Research Proposal Requirements

A detailed research proposal will be required for PhD students.

12. Special Registration Information

Not applicable.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for University of Calgary scholarships must submit their applications to the Department by February 1.

14. Faculty Members/Research Interests

Information about faculty members and their research interests may be found at http://www.schulich.ucalgary.ca/enci/faculty.

Engineering, Electrical and Computer ENEL

Contact Information
Location: ICT Building, Room 402
Faculty number: 403.220.7596
Fax: 403.282.6855
E-mail address: grad-studies@enel.ucalgary.ca
Web page URL: http://www.enel.ucalgary.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
Master of Engineering (MEng), thesis and course-based
The Master of Science and Doctor of Philosophy degrees with a specialization in Software Engineering are offered jointly through the Department of Electrical and Computer Engineering and the Department of Computer Science.

The Department also offers specializations in Telecommunications, VLSI and Microelectronics, Image Processing, Computer Engineering, Power Electronics, Control Systems, Power Systems, Energy and Environment (Interdisciplinary), Environmental Engineering (Interdisciplinary) and Biomedical Engineering.

The Universities of Calgary and Alberta offer a joint Biomedical Engineering Program. Further information can be obtained from the separate listing in this Calendar. All programs are available to both full-time and part-time students. For details, see the Schulich School of Engineering.

2. Admission Requirements

In addition to Faculty of Graduate Studies and the Schulich School of Engineering requirements, the Department requires:

Master of Engineering and Master of Science
A Bachelor's degree in electrical engineering or computer engineering.

Master of Science, Specialization in Software Engineering
a) At least one year of experience in software development
b) Background knowledge in C or C++
c) Knowledge of object-oriented design and human-computer interaction

Note: Applicants with degrees in other disciplines may be considered, but additional undergraduate courses in electrical engineering may be required prior to admission.

Doctor of Philosophy

A Master's degree in electrical engineering, computer engineering, or software engineering.

Note: Transfer to the doctoral program without completing the Master's degree may be approved for exceptional students whose BSc degrees are in electrical engineering, computer engineering or software engineering.

3. Application Deadline

The preferred starting date for all graduate degrees is September.

Deadlines for submission of complete applications:
March 1 for September admission
June 30 for January admission

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission or for grades below "B".

5. Program/Course Requirements

In addition to Faculty of Graduate Studies and the Schulich School of Engineering requirements, the Department requires:

Master of Engineering (course-based)
a) Ten to twelve half courses of which at least seven must be graduate courses in electrical engineering
b) Students are encouraged to include Electrical Engineering 698 - Graduate Project in their programs. Normally Electrical Engineering 698 is taken as the last course, or concurrently with the last courses of the program. A copy of the Procedures and Guidelines is found on the departmental website.

Master of Engineering (thesis-based)
Normally, five to eight graduate half courses.

Master of Science

Normally, four to seven graduate half courses of which at least three must be in the area of specialization.

Master of Science, Specialization in Software Engineering

a) 2.0 full-course equivalents selected from a specified list of courses
b) An applied software engineering project written up as a Master of Science thesis and
examined by an examination committee as specified in the Faculty regulations.

**Doctor of Philosophy** [UPDATED]

a) Normally, six to nine graduate half courses (at least seven in electrical engineering) beyond the Bachelor's degree, or two to five graduate half courses beyond the Master's degree with no fewer than half the courses in the Departmental program.

b) A written and an oral candidacy examination

6. Additional Requirements

While studying full-time in the MSc or PhD program:

a) Students will be required to attend only two semesters of Electrical Engineering 605/607 at the beginning of their graduate studies program.

b) Students in the PhD program who completed the course in the MSc program will not be required to take the Electrical Engineering 605/607 for the second time.

c) Students who are required to take Electrical Engineering 605/607 may successfully present two seminars.

7. Credit for Undergraduate Courses

Where appropriate, and with approval of the supervisor and the Department, fourth year undergraduate courses (a maximum of two half courses for the Master of Science and one half course for Doctor of Philosophy) may be taken for credit toward a graduate degree.

8. Time Limit

Expected completion time is 20 months of full-time study for the Master of Science and four years for the Doctor of Philosophy. The maximum completion time is four years for the Master of Science and the Master of Engineering (thesis-based) and six years for the Master of Engineering (course-based) and the Doctor of Philosophy.

9. Supervisory Assignments

In all programs, a supervisor to provide guidance to the student is normally selected at the time of admission.

10. Required Examinations

See "Engineering Programs".

11. Research Proposal Requirements

Master of Science and Master of Engineering (thesis-based)

As required by the supervisor.

**Doctor of Philosophy**

The research proposal is approved during the candidacy examination.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance in the form of scholarships, teaching assistantships and research assistantships may be available through the Department. International students may be eligible for reimbursement of the tuition fee differential. Applications for scholarships must be submitted by January 15.

14. Other Information

Students enrolled in any of the engineering graduate programs may opt, in addition to their normal required course load, to undertake an international project outside Canada. The duration of the project should be between four and six months. Details of research, courses, and financial assistance and other information are on the Departmental website.

15. Faculty Members/Research Interests

The active research interests of individual faculty members can be found at http://www.enel.ucalgary.ca.

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**Engineering, Geomatics ENGO**

**Contact Information**

Location: Schulich School of Engineering, Room E228

Faculty number: 403.220.4979

Fax: 403.284.1980

E-mail address: lamarkla@ucalgary.ca

Web page URL: http://www.geomatics.ucalgary.ca/

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)

Master of Science (MSc), thesis-based

Master of Engineering (MEng), thesis and course-based

Areas: Positioning, navigation and wireless location; Earth observation; Digital imaging systems (Biomedical Engineering); and GIS and land tenure

See "Engineering Programs" for further degree specializations.

2. Admission Requirements

See "Engineering Programs".

3. Application Deadline

Deadlines for submission of complete applications:

Canadian and Permanent Resident Admissions

September 1 for September admission

January 1 for January admission

May 1 for May admission

July 1 for July admission

International Admissions

March 31 for September admission

July 31 for January admission

November 30 for May admission

January 30 for July admission

4. Advanced Credit

See "Engineering Programs".

5. Program/Course Requirements

In addition to Faculty of Graduate Studies requirements and the Schulich School of Engineering, the Department requires:

Students in all thesis programs must complete a Technical Report Writing course. In consultation with the Supervisor and the Graduate Director, this requirement can be waived for students with prior experience and skills in technical report writing.

**Master of Engineering (course-based)**

See "Engineering Programs".

**Master of Engineering (thesis-based)**

a) A minimum of five half courses, of which at least four must be graduate courses

b) After satisfactory progress in the student's own research work, enrolment in the Geomatics Engineering 605 Research Seminar course

c) A thesis related to original engineering analysis or design

**Master of Science**

a) A minimum of five half courses, of which at least four must be graduate courses

b) After satisfactory progress in the student's own research work, enrolment in the Geomatics Engineering 605 Research Seminar course

c) Attend six seminars (Geomatics Engineering 605, 607, and/or 609) in total. One page report should be submitted for each seminar.

d) A thesis related to original engineering research

**Doctor of Philosophy**

a) A minimum of three graduate half courses beyond the Master of Science course requirements. For students who transfer from a Master of Science to a doctoral program, a minimum of two graduate half courses beyond the Master of Science course requirements.

b) After satisfactory progress in the student's own research work, enrolment in the Geomatics Engineering 607 and 609 Research Seminar courses, normally not to be taken in the same term

c) Attend six seminars (Geomatics Engineering 605, 607, and/or 609) in total. One page report should be submitted for each seminar.

d) A written and an oral candidacy examination based on the graduate course work

e) A thesis related to advanced original engineering research

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.

8. Time Limit

See "Engineering Programs".
9. Supervisory Assignments
See “Engineering Programs”.

10. Required Examinations
Master’s Programs
See “Engineering Programs”.

Doctoral Programs
Doctoral Candidacy Examination
The candidacy examination has a written and an oral component. The student's background knowledge in the field of Geomatics Engineering and in-depth knowledge in his/her chosen research specialization is examined.

The written examination is an open book examination of one day’s duration. It consists of a comprehensive examination in the candidate’s field of specialization and of a general examination in at least one of the other graduate streams in Geomatics Engineering, referred to as major and minor parts in the following. The major part will usually be of three hours duration and will count for 2/3 of the mark of the written component. The minor part will last one-and-a-half hours and will count for 1/3 of the mark of the written component. Passing marks in both the major and the minor parts are required to pass the written examination. A recommended reading list for the written examination will be made available to the student upon request.

The oral examination will further test the candidate’s knowledge of his/her field of study in particular, and of geomatics in general, in addition to providing an opportunity to clarify, defend and extend answers in the written examination. Although the purpose of the candidacy exam is not to examine or approve the student’s research proposal, questions on the research proposal may be included in the oral candidacy exam to assess the background knowledge and preparedness of the student to conduct doctoral research of high quality in his/her field of study.

Doctoral Final Oral Examination
See “Engineering Programs”.

11. Research Proposal Requirements
Master of Engineering (thesis-based)
A preliminary thesis proposal, consisting of five to eight pages, accepted by the supervisor, is required no later than 16 months after initial registration. Contents of the thesis, reflecting an applied approach to a problem, should contain new elements of engineering principles and applications.

The thesis proposal should include the following:
1. Statement of the problem
2. Research objectives
3. Literature review
4. Methodology and procedures
5. Outline of thesis contents
6. Proposed time schedule
7. Bibliography and references

Master of Science
The Master of Science thesis proposal requirements, including the outline of the proposal’s contents, are the same as those for the Master of Engineering (thesis-based). The thesis topic, however, should deal with original theoretical or practical research in Geomatics Engineering.

Doctor of Philosophy
The doctoral thesis proposal requirements, including the outline of the proposal’s contents, are the same as those for the Master of Engineering (thesis-based). The thesis, however, must demonstrate the candidate’s ability to pursue original research at a high level and represent a distinct advance in knowledge on the subject. The research should be of the recognized standard of technical journals requiring critical review. The supervisor and supervisory committee will normally require progress reports every six months during the doctoral program.

12. Special Registration Information
None.

13. Financial Assistance
Candidates are not admitted unless self-funded or with financial support provided by an interested supervisor. For information on awards, see the Awards and Financial Assistance section of this Calendar.

14. Other Information
See “Engineering Programs”.

In addition, the Department offers a designated set of graduate half courses in each of the five specialization areas. Additional graduate courses are offered as Special Studies and Project courses. The Department also offers a Distinguished International Lecturer Series, which consists of approximately four to five courses offered annually by invited professors and researchers.

15. Faculty Members/Research Interests
Information about the Department’s research areas may be found at http://www.geomatrics.ucalgary.ca/research/.

Program Descriptions
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Engineering, Mechanical and Manufacturing ENME
Contact Information
Location: Mechanical Engineering Building, Room 506
Faculty number: 403.220.4154/3541
Fax: 403.282.8406
E-mail address: grad@enme.ucalgary.ca
Web page URL: http://www.eng.ucalgary.ca/Mechanical/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc) thesis-based
Master of Engineering (MEng), thesis and course-based

Areas: applied mechanics, automation, control, robotics and nano MEMS, biomechanics, design, manufacturing systems, materials and manufacturing processes, thermofluids, energy systems and environment.

Specializations:
- Pipeline Engineering
- Engineering, Energy & Environment - Interdisciplinary Specialization (ENE)
- Environmental Engineering – Interdisciplinary Specialization (ENEN)

A Biomedical Engineering program (BMEN) is offered jointly with the University of Alberta.

Further information on the Pipeline Engineering specialization may be found at www.schulich.ucalgary.ca/BMEN. Information on the Engineering, Energy & Environment and Environmental Engineering interdisciplinary specializations and the Biomedical Engineering program may be found in their separate listings in this Calendar.

2. Admission Requirements
In addition to the Faculty of Graduate Studies and the Schulich School of Engineering’s minimum requirements, the Department’s requirements are as follows:

Master’s Programs
a) BSc degree or equivalent.
b) A minimum admission grade point average of 3.00 on a four-point scale or equivalent.

Doctor of Philosophy
MSc degree, or transfer from MSc program with a BSc degree grade point average of 3.60 or higher on a four-point scale. Transfer from MSc to PhD program is allowed only after the successful completion of all courses required for the MSc degree with a grade point average of 3.50 or higher on a four-point scale.

3. Application Deadline
Deadlines for submission of complete applications:
April 15 for September admission
August 15 for January admission
December 15 for May admission

4. Advanced Credit
See “Engineering Programs”.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies and the Schulich School of Engineering minimum requirements, the Department requires:

Master of Engineering (course-based)
Ten half courses, no more than four of which can be senior undergraduate courses.

Master of Engineering (thesis-based)
(a) Five to six half courses.
(b) Presentation of one research seminar when registered in Mechanical Engineering/Manufacturing Engineering 613.
Master of Science
(a) Five to six half courses of which two may be taken from outside the Department.
(b) One course to be selected from Mechanical Engineering 631 - Numerical Methods for Engineers or Mechanical Engineering 633 - Mathematical Techniques for Engineers.
(c) Presentation of one research seminar when registered in Mechanical Engineering/ Manufacturing Engineering 613.

Doctor of Philosophy
(a) Seven to ten half courses at the graduate level (up to two half courses may be taken from outside the Department): one to be selected from Mechanical Engineering 631 or Mechanical Engineering 633, or two to six half courses beyond the Master's degree.
(b) Presentation of one research seminar when registered in Mechanical Engineering/ Manufacturing Engineering 713.

Note: Further details of Departmental requirements are listed in the Department's Graduate Studies Guidebook.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
See Section 5 for details.

8. Time Limit
See "Engineering Programs".

9. Supervisory Assignments
See "Engineering Programs".

10. Required Examinations
See "Engineering Programs".

11. Research Proposal Requirements
None beyond Graduate Studies' requirements.

12. Special Registration Information
None.

13. Financial Assistance
See "Engineering Programs".

14. Other Information
See "Engineering Programs".

15. Faculty Members/Research Interests
Active research programs and research interests of current faculty can be found at http://www.eng.ucalgary.ca/enme/research.

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), course-based and thesis-based
Areas: British, American, Canadian and International literatures in English
A Creative Writing option is available in the Master of Arts (thesis-based) and Doctor of Philosophy programs.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts (course-based and thesis-based)
(a) A University of Calgary Honours degree or its equivalent in English (10 full courses in English)
(b) A Statement of Intent
(c) A sample of critical writing; for creative writing applicants, an additional 10-page sample of creative writing
(d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 600 (written test), 100 (Internet-based test), a MELAB score of 84, an IELTS score of 7.5, or a PTE score of 7.0
(e) Two references letters

Doctor of Philosophy
(a) A Master of Arts Degree in English or its equivalent
(b) A Statement of Intent
(c) A sample of critical writing; for creative writing applicants, an additional 10-page sample of creative writing
(d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 600 (written test), 100 (Internet-based test), a MELAB score of 84, an IELTS score of 7.5 or a PTE score of 7.0
(e) Two references letters

3. Application Deadline
The deadline for the submission of complete applications is January 10 for September admission.

4. Advanced Credit
Application for advanced credit must be made to the Department Head at the time of admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department normally requires:

Master of Arts (thesis-based)
(a) Three full-course equivalents in English at the 600 or 700 level beyond the Honours BA
(b) English 696 or its equivalent
(c) A reading knowledge of a language other than English

Master of Arts (course-based)
(a) Four full-course equivalents in English at the 600 or 700 level beyond the Honours BA or equivalent
(b) English 696 or its equivalent
(c) A reading knowledge of a language other than English

Note: Only the course-based Master of Arts program is open to part-time students.

Doctor of Philosophy
(a) Six full-course equivalents in English at the 600, 700, or 800 level beyond the Honours BA or three full-course equivalents in English beyond the MA
(b) English 696 or its equivalent
(c) A reading knowledge of a language other than English
(d) A Major Field Examination
(e) A Minor Field Examination

6. Additional Requirements
All students must attend an orientation session.

Second Language Requirement
The Department of English requires, for both the MA and PhD, knowledge of one language other than English. Students are encouraged to establish competency in a language that contains a body of texts relevant to their program of study. This requirement can be met in the following ways:
(a) A minimum grade of "B" in a full course or each of two half courses at a senior (300) level
(b) Passing the department reading exam. Computer-based courses in French (French 235 - French 237 and French 335 - French 337) and German (German 201 - German 213) are available and would be helpful in preparing for the department set exam.
(c) Documentation establishing native proficiency in a language other than English

It is the responsibility of the student to supply evidence of native proficiency or evidence that course work in a language at another university meets the requirement spelled out in this guide. Students who do not meet the requirement upon entry should consult with the Associate Head (Graduate Program) no later than the week before classes begin about the best approach to take.

7. Credit for Undergraduate Courses
With the approval of the Department, all graduate students may take for credit up to one full-course equivalent at the 500 level (excluding English 504).

8. Time Limit
Expected completion time is two years for the Master of Arts (thesis-based), and four years for the Master of Arts (course-based) and Doctor of Philosophy degrees. Maximum completion time is four years for the Master of Arts (thesis-based) and six years for the Master of Arts (course-based) and Doctor of Philosophy degrees.

9. Supervisory Assignments
For the first seven months of the program, students are assigned an interim advisor to give them time to familiarize themselves with...
faculty members’ research before securing a permanent supervisor.

Master of Arts (thesis-based)

By March 1 of the first year, each student must submit a proposed field of research, and the name of a proposed supervisor to the Graduate Executive Committee for approval.

Master of Arts (course-based)

By March 1 of the first year of study, each student must submit the name of the proposed supervisor to the Graduate Executive Committee for approval (August 15 for part-time students).

Doctor of Philosophy

By April 1 of the first year, each student must submit the name of the proposed supervisor and the proposed areas of the major and minor field examinations to the Graduate Executive Committee for approval. By September 30 of the second year, the supervisor, following consultation with the student, will submit the names of the proposed supervisory committee to the Graduate Executive Committee for approval.

10. Required Examinations

Doctoral Candidacy Examinations

Before formally embarking on the writing of the PhD thesis, all students must pass the following:

1. A written Minor Field Examination based on one of the Department’s Field Reading Lists and distinct from the Major Field.

2. A Major Field Examination that forms the basis of the candidacy oral. The written Major Field Examination is based on one of the Department’s Field Reading Lists. Prepared by the Supervisory Committee, the examination consists of three parts, each requiring the student to answer one of two questions (for a total of three of six questions). The Major Field Examination forms the basis of, and must be completed no less than ten working days before, the Candidacy Oral Examination.

The Candidacy Oral Examination is a formal oral examination scheduled by the Faculty of Graduate Studies no later than 28 months after the student’s initial registration in the program (for those who entered the program with an M.A. degree).

This oral examination should address issues arising from the written examination. Examiners are asked to record their assessment of the written component by commenting on the use of relevant literature and techniques, organization, literary competence, originality, argumentation leading to the conclusions, and anything else they consider important.

At the end of the Candidacy Oral Examination, the examiners judge the student’s performance, including written and oral components, Pass or Fail. Questions on the Research Proposal will not be included in the Oral Examination.

Consult the Department website for details. Final thesis oral examinations are open.

11. Research Proposal Requirements

Master of Arts (thesis-based)

By May 1, no later than eight months after initial registration, each student must submit a thesis proposal on the form Registration of MA Thesis Topic to the Graduate Executive Committee. Further details are available from the department.

Doctor of Philosophy

By September 30 of the second year, each student must submit a thesis proposal on the form Initial PhD Thesis Research Proposal and Supervisory Committee to the Graduate Executive Committee.

The student must submit a Final PhD Thesis Proposal and Bibliography form along with a final thesis proposal and bibliography to the doctoral supervisory committee within three months of successful completion of the candidacy examinations. Further details are available from the department.

12. Special Registration Information

Students must register for courses by the end of June. Continuing students and new students who are to do so should consult the course instructors before they register. Other new students should consult the course instructors as soon as they arrive on campus. Final approval to enter a course is given by the Head or Associate Head of the Department.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships are advised to have their applications to the Department by December 15.

14. Other Information

None.

15. Faculty Members/Research Interests

Detailed information about faculty members and their research interests may be found at http://english.ucalgary.ca/contact-us/directory.

Program Descriptions

Environmental Design

EVDS

Contact Information

Location: Professional Faculties - 2182
Faculty number: 403.220.6601
Fax: 403.284.4399
E-mail address: evdsinfo@ucalgary.ca; and evdsphd@ucalgary.ca
Web page URL: http://www.ucalgary.ca/evds/

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)

Master of Environmental Design (MEDes), thesis-based

Master of Environmental Design (MEDes (Planning)), course-based

Master of Architecture (MArch), course-based

2. Admission Requirements

In addition to Faculty of Graduate Studies requirements, the Faculty of Environmental Design requires:

Doctor of Philosophy

a) For applicants required to prove proficiency in English, a TOEFL score of 600 (written test); or 100 (Internet-based test); or an IELTS score of 7.5, or a MELAB score of 8, or a PTE score of 70;

b) An admission grade point average (GPA) above 3.50 on a four-point scale;

c) A statement of interest that describes the nature of the thesis research the applicant expects to undertake. This is not a detailed thesis proposal, but will be used by an admissions committee as an indicator of the applicant’s ability to conduct doctoral level research and to determine if adequate supervisory and research funding resources are available to support the proposed program. Only if such resources are available will the student be admitted;

d) A qualified supervisor from the Faculty of Environmental Design will be identified once admission is recommended by an admissions committee and the student has been admitted by the Faculty of Graduate Studies;

e) Three reference letters.

Master of Environmental Design (thesis-based)

In addition to Faculty of Graduate Studies requirements, the Faculty of Environmental Design requires:

As an interdisciplinary degree, applications are encouraged from a variety of academic backgrounds (including first professional degrees in planning and design) or a combination of undergraduate degree and work-related experience.

Applicants for the Master of Environmental Design must provide:

a) A clear, well written, statement of intent which describes how the applicant’s specific educational background and professional or personal experience relates to Environmental Design as a field of study and the applicant’s future ‘vision’ for pursuing a graduate degree in Environmental Design (related to personal and professional goals and intentions);

b) A clear, well written and substantive statement of thesis research interests which informs the Admissions Committee of the applicant’s supervisory needs;

c) A ‘portfolio’ of the applicant’s work as selected by the applicant, to include 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;

AND provides examples or illustrates the applicant’s design work, graphics, visual
communication, creative thinking, community action, or creative ideas as related to the applicant’s statement of intent. If any of the work involves collaboration with others, please clearly identify what aspects of the work are from others. This portfolio should be submitted in digital form (pdf files) on a CD/DVD or in format easily downloaded to a CD or DVD;

d) Three reference letters.

Master of Environmental Design (Planning) (course-based)
In addition to the Faculty of Graduate Studies requirements, the Faculty of Environmental Design requires:

a) A clear, well written, statement of intent which describes the applicant’s preference for one of the planning streams and how the applicant’s specific educational background and professional or personal experience relates to Planning as a field of study and the applicant’s future ‘vision’ for pursuing a graduate degree in Environmental Design (related to personal and professional goals and intentions;

b) Three reference letters.

Master of Architecture
In addition to Faculty of Graduate Studies requirements, the Faculty of Environmental Design requires:

a) Prospective applicants are advised to use opportunities within their four year recognized university undergraduate degree studies to develop knowledge in design, the humanities, social sciences, arts, engineering, biological and/or physical sciences – including, wherever possible, studio, laboratory and collaborative learning experiences;

b) Applicants must demonstrate successful completion of ten prerequisite half course requirements in four areas: Design, Technology, Communications, and History/Theory (equivalent to the courses taken in the minor in Architectural Studies).

Applicants may be admitted to the M.Arch ‘Foundation’ or qualifying year in order to complete these prerequisite requirements. An assessment of these prerequisite requirements will be made by an admissions committee and applicants will be informed in offers of admission which, if any, courses at the Foundation level will be required;

c) Applicants must provide evidence of original and/or creative work in any field or medium and demonstrate in writing the relevance of the skills shown by this work to the study of Architecture. This work should be presented in a compact form (box, envelope or binder no larger than 297 mm by 297 mm [11” x 11”] format). If any of the work involves collaboration with others, please clearly identify what aspects of the work are from others;

d) Three reference letters.

3. Application Deadline

Doctor of Philosophy
The deadline for the submission of complete applications is February 1 for September admission. There is normally no January admission.

Deadlines for the submission of complete applications for students with Canadian or US transcripts:

- April 1 for September admission
- September 1 for January admission

Master of Environmental Design and Master of Architecture
Applications are accepted from December 1 through February 1 for September admission. There is no January admission. Please note that new admissions to both Masters Degree Programs may be limited in number on an annual basis.

4. Advanced Credit

Applicant must make advanced credit requests as part of the admission process. Advanced credit will not be given for courses taken more than five years prior to admission application. Credit will not be given for courses taken to bring the grade point average to a required level for graduate studies admission.

5. Program/Course Requirements

In addition to Faculty of Graduate Studies requirements, the Faculty of Environmental Design requires:

Doctor of Philosophy

a) Students complete Environmental Design 601 Interdisciplinary Seminar, one thematic elective relevant to their area of research, i.e. Environmental Design 723 – Interdisciplinary Intervention in Environmental Design (decimized half course), and at least one other half course recommended by the student’s interim advisor. The PhD Coordinator must approve these courses.

b) Additional course work when recommended by the student’s interim advisor or supervisor.

Fieldwork and research done off-campus may be counted towards fulfillment of the full-time study and research requirement.

Master of Environmental Design

MEDes (thesis-based)

An individual student Program of Study (POS) will be submitted by all students for approval by the MEDes Graduate Coordinator. The POS must include the following academic requirements:

a) Required Courses:

- Environmental Design 603 (HCE): Design Thinking Studio
- Environmental Design 601 (HCE): Interdisciplinary Seminar
- Environmental Design 751 (HCE): Thesis Research and Design Studio

b) A minimum of two half course electives, one of which must be an approved EVDS or EVDP studio course (e.g. EVDS 618, EVDP 625, EVDS 628, EVDP 638, EVDS 723);

c) A research thesis based on an approved thesis proposal and signed by the Thesis Supervisor. The approved student thesis proposal must form part of the POS for Unconditional POS approval;

d) Satisfactory annual Faculty of Graduate Studies student progress reports.

MEDes (Planning) (course-based)

An individual Program of Study (POS) will be submitted by all students for approval by the MEDes Graduate Director. The POS must include the following academic requirements totaling at least 17 HCEs:

a) Core Required Courses:

- Environmental Design 601 (HCE)
- Environmental Design Planning 621 (HCE)
- Environmental Design Planning 623 (HCE)
- Environmental Design Planning 625 (HCE)
- Environmental Design Planning 627 (HCE)
- Environmental Design Planning 631 (HCE)
- Environmental Design Planning 633 (HCE)
- Environmental Design Planning 635 (HCE)
- Environmental Design Planning 637 (HCE)
- Environmental Design Planning 644 (FCE)

b) All of the required courses for one of the following three streams:

i) Regional and Environmental Planning

- Environmental Design 624 (HCE)
- Environmental Design 626 (HCE)

- a minimum of three half course, approved, planning-related electives.

ii) City and Community Planning

- Environmental Design 628 (HCE)
- Environmental Design 618 (HCE)
- Environmental Design 622 (HCE)

- a minimum of two half course, approved planning-related electives

iii) Urban Design and Development

- Environmental Design 618 (HCE)
- Environmental Design 622 (HCE)
- Environmental Design 671 (HCE)

- a minimum of two half course, approved planning-related electives

Master of Architecture

The M.Arch is a first professional degree in Architecture accredited by the Canadian Architectural Certification Board (CACB). The M.Arch is a two year course-based degree with a Foundation year for those applicants without a design-related four year undergraduate degree. After its last review in 2005, the University of Calgary Master of Architecture professional program was accredited for six years by the CACB. This is the maximum period for which programs can be accredited between reviews. Under NAFTA, this means that accredited Canadian degrees are fully recognized in the USA and vice versa. In Canada, all provincial associations recommend a degree from an accredited professional degree program in architecture, recognizes two types of accredited degrees, the Bachelor
Program Descriptions

of Architecture and the 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 degrees 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. A student Program of Study (POS) will be submitted by all students registered in the two year MArch for approval by the MArch Graduate Coordinator. The POS must include the following academic requirements:

a) Foundation, First and Second Year required courses:

b) MArch students are required to take the Somerville Design Charrette (quarter-course), the Gillmor Theory Seminar (quarter-course) or the Taylor Practice Seminar (quarter-course), which are offered as one week block courses, at least once (may be repeated for elective credit).

c) Five half course (or equivalent) electives are required.

d) Satisfactory annual Faculty of Graduate Studies student progress reports.

Required courses in the two year MArch program:

Environmental Design Architecture 682.02 (FCE)
Environmental Design Architecture 619 (HCE)
Environmental Design Architecture 663 (HCE)
Environmental Design Architecture 621 (HCE)
Environmental Design 697 (QCE)
Environmental Design Architecture 682.04 (FCE)
Environmental Design Architecture 611 (HCE)
Environmental Design Architecture 613 (HCE)
Environmental Design Architecture 615 (QCE)
Environmental Design Architecture 617 (QCE)
Environmental Design Architecture 661 (HCE)
Environmental Design Architecture 782 (FCE)
Environmental Design Architecture 782 (FCE)

Required courses in the MArch Foundation year:

Environmental Design 503 (HCE)
Environmental Design 501 (HCE)
Environmental Design Architecture 511 (HCE)
Environmental Design Architecture 523.01 (HCE)
Environmental Design Architecture 541 (HCE)

Environmental Design Architecture 582 (FCE)
Environmental Design 523 (HCE)
Environmental Design Architecture 523.02 (HCE)
Environmental Design Architecture 543 (HCE)

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

Master of Environmental Design

Only where appropriate to a student’s individual Program of Study may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.

Master of Architecture

With the exception of Foundation year courses, only where appropriate to a student’s Program of Study may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.

8. Time Limit

All PhD requirements must be completed within six registration years.

All MEDes (including MEDes (Planning)) and MArch requirements must be completed within four registration years, excluding the MArch Foundation Year.

9. Supervisory Assignments

Doctor of Philosophy

At the time of admission, each student will be assigned an interim advisor, who may or may not become the student’s thesis supervisor. The interim advisor, in consultation with the PhD Coordinator, will recommend a program of courses that must be approved by the PhD Coordinator.

During the first year of studies, the student, with the advice of the interim advisor and the PhD Coordinator, will prepare a thesis proposal and propose a supervisor and the other members of a supervisory committee for approval by the PhD Coordinator.

Master of Environmental Design (thesis-based)

Upon admission, each MEDes student will be assigned an interim Supervisor appropriate to their admissions statement of intent and thesis research area who may assist with POS development and thesis proposal development. Within twelve months of first registration a Thesis Supervisor will be approved specific to the student’s approved thesis proposal.

Master of Environmental Design Planning (course-based)

Upon admission, each MEDes student will be assigned an academic advisor to assist with POS development.

Master of Architecture

Upon admission each MArch student will be assigned a Program Advisor to assist with POS development.

As part of the MArch research studios in second year, research project advisor will be assigned to students on an individual interest basis.

10. Required Examinations

Doctor of Philosophy

Doctoral students are required to complete both a written and oral candidacy examination. The written candidacy examination normally consists of a set of four questions set by the supervisory committee and taken in the second year of the program (or possibly the third year for students entering the program without a Master’s degree), after the completion of course work and after approval of the doctoral thesis proposal. At least six months before the written examination, the supervisory committee will prepare a written outline of the material to be covered in the exam, a recommended reading list and a draft examination schedule. Normally, the student will be given two weeks to complete the written candidacy papers. Within one month of completing the written candidacy, the student will take an oral examination.

The written papers will form the basis of the oral candidacy examination although questions may extend beyond the written papers to areas outlined in the notice of candidacy examination.

Final thesis oral examinations are open.

Master of Environmental Design (thesis-based)

Final thesis defence oral examination.

Master of Architecture

Comprehensive exit requirement is a research studio project presented in a review format.

11. Research Proposal Requirements

Doctor of Philosophy

Approval of the thesis proposal by the supervisory committee and the PhD Coordinator is required as noted in the “Supervisory Assignments” above. Thesis Proposals should clearly describe the project in terms of Title, Objectives, Background, Methodology and Results and must include an explicit interventionist or problem-solving component.

Master of Environmental Design

Thesis proposals will be presented and reviewed upon completion of first year thesis research design studio. Final thesis proposals will be individually approved by an approved Supervisor.

Master of Architecture

Design research studio proposals will be approved by Research Studio Project Advisors.

12. Special Registration Information

None.
13. Financial Assistance
Financial assistance may be available to qualified students but cannot be guaranteed. For information on admission and academic awards, see the Awards and Financial Assistance section of this calendar, the EVDS website and the Awards Data Base on the Faculty of Graduate Studies website.

14. Other Information
None.

15. Faculty Members/Research Interests
Current information about faculty members and research interests can be found at http://www.ucalgary.ca/evds/people.

French, Italian and Spanish FISL

Contact Information
Location: Craig Hall, Room D310
Faculty number: 403.220.4001
Fax: 403.284.3634
E-mail address: fisgrad@ucalgary.ca
Web page URL: http://fis.ucalgary.ca

1. Degrees and Specializations Offered
Master of Arts (MA), thesis and course-based routes, in French and Spanish.

Full-time and part-time studies are possible. Areas: French Language Studies, French Literature from the Medieval to the Contempory periods, French-Canadian Literature, Francophone Literatures and Film, Hispanic Language Studies and literatures, Hispanic Cultures and Film, Comparative Literature, Literary Theory, Second Language Learning and Teaching (including computer-assisted language learning).
The Department also participates actively in interdisciplinary degree programs, such as Canadian Comparative Literature (with English) and Film.

2. Admission Requirements
Doctor of Philosophy (PhD)
Applicants wishing to undertake a doctoral program on a special case basis should contact the Department.

Master of Arts
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires students:

a) To demonstrate a sufficiently high level of oral and written competence in the French or Spanish language.
b) To have an adequate academic background in the discipline.
c) To submit an example of the applicant’s written work: a term paper, research paper or other writing, which the applicant considers representative of his or her best work.
The paper must be in either French or Spanish, depending on the language of study.
d) A 250-word (minimum) statement of research interest including research topic and the reasons for wishing to pursue graduate work in this Department.
e) Two reference letters.

3. Application Deadline
Deadlines for the submission of complete applications:
Special Case Doctor of Philosophy: February 1
Master of Arts: February 21 All programs: March 1 for September admission (with no scholarship application)
Applications received later than the deadline will be considered for admission and for departmental funding, but chances of financial support are greatly reduced.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be granted for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
Master of Arts
Note: Normally no more than one half course of Directed Reading may be taken for credit.
In addition to Faculty of Arts requirements, the Department normally requires:

Master of Arts (thesis-based)
Six half-course equivalents (including French 605 or Spanish 601, depending on the language of study)

Master of Arts (course-based)
Ten half-course equivalents (including French 605 or Spanish 601, depending on the language of study)

Applicants lacking the requisite background in language or literature may be admitted as qualifying students. In this case, extra course work is normally required. A qualifying oral examination based on set texts may be required before the students attain regular Master of Arts status. Courses taken as a qualifying student do not normally count as part of the student’s course requirements.

6. Additional Requirements
Master of Arts
a) All students must attend an orientation session.
b) Both options have a knowledge areas requirement that must be satisfied before or after admission. Upon admission students will be advised of any specific course or other work needed to fulfill this requirement.
c) Before the end of their second year of study, MA Thesis students are required to make a departmental or external presentation relating to their research.
d) Students in the thesis-based and course-based programs are also expected to demonstrate their participation in university-wide research activities by attending at least five departmental or external scholarly presentations every year in their programs.
Information on the presentations and a one page critical summary for each one must be submitted with the Annual Progress Report.

7. Credit for Undergraduate Courses
Master of Arts
Only in exceptional circumstances and where appropriate to a student’s program may graduate credit be received for courses numbered 500-599. No more than two half courses can be at the 500 level.

8. Time Limit
Master of Arts
Expected completion time for full-time students is two years for a thesis program and three years for a course-based program.
Maximum completion time is four years for a thesis program and six years for a course-based program.

9. Supervisory Assignments
Master of Arts
Newly admitted students begin their programs under the supervision of the departmental Graduate Director. Students are expected to choose a permanent supervisor by the end of the second regular academic session after first registration (April 30 for September registrants and December 15 for January registrants). Selection of a supervisor should be by mutual agreement between the student and the staff member concerned, approved by the Graduate Director.

10. Required Examinations
Master of Arts
Comprehensive examination (course-based) The course-based program requires a comprehensive examination with a written and an oral component, taken after the completion of all course work and any other requirement such as the knowledge areas requirement. Students are required, as early as possible and, in any case, at least before registering for an eleventh semester to file the reading list on their chosen area of specialization with the Department’s Graduate Committee. The list should be drafted after consultation with the student’s supervisor and approved by that faculty member.

Final oral thesis examinations are open.

Special Case Doctor of Philosophy (PhD)
Comprehensive Examination
The Comprehensive Examination tests a PhD candidate’s knowledge of a field or fields related, but not identical to his/her research. It consists of a take-home written portion and a two-hour oral portion of the examination. This examination is a requirement of the Department of French, Italian and Spanish.

Candidacy Examination
The Candidacy Examination is designed to show the candidate’s ability to work in depth with a research question essential to the dissertation research. The Department requires a written portion as well as an oral portion for the Candidacy Examination.
Questions on the dissertation proposal will not be included in the oral candidacy examination of special case doctoral degree students.

Final oral thesis examinations are open.

11. Research Proposal Requirements

Master of Arts

Thesis students are required to submit a written thesis proposal fourteen months after initial registration (October 31 for September registrants and February 21 for January registrants). This proposal should be approximately 1200 words in length and be accompanied by an abstract and an appropriately detailed preliminary bibliography. It should be drafted after consultation with the student’s supervisor and have his/her preliminary approval. These documents will be circulated to the departmental Graduate Committee for approval. Abstracts of proposals may be reproduced for information purposes.

12. Special Registration Information

None.

13. Financial Assistance

Master of Arts

Funding is available to qualified thesis-based students in the form of scholarships awards and/or teaching assistantships. Master of Arts students can expect to receive funding for a maximum of 20 months. Doctoral students can expect to receive funding for a maximum of 44 months. Students applying for departmental funding for the following academic year must submit their applications to the Department by February 22. All students are strongly encouraged to seek external financial assistance throughout their program. For information on other funding opportunities, see the Awards and Financial Assistance section of this Calendar and the Faculty of Graduate Studies website: http://www.grad.ucalgary.ca/awards.

14. Other Information

Master of Arts - Doctor of Philosophy

Prospective students are encouraged to consult either the Head of the Department or the Graduate Director. Detailed information on our programs is also available at http://fis.ucalgary.ca.

15. Faculty Members/Research Interests

Information about faculty members and their research interests may be found at http://fis.ucalgary.ca/.

Geography GEOG

Contact Information
Location: Earth Sciences Building, Room 356
Department number: 403.220.5584
Fax: 403.282.6561
E-mail address: geograd@ucalgary.ca
Web page URL: http://geog.ucalgary.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based
Master of Science (MSc), thesis-based
Master of Geographic Information Systems (MGIS), course-based with research component

2. Admission Requirements

In addition to Faculties of Graduate Studies and Arts requirements, the Department of Geography requires all MA/MSc and PhD applicants to submit:

a) A proposal describing applicant’s intended research area
b) A current curriculum vitae or résumé
c) Two reference letters

For MGIS applicants the Department requires:

a) A statement of interest outlining the applicant’s goals, motivation for applying to the program, and research area of interest
b) A current curriculum vitae or résumé
c) Two reference letters

For the academic background requirements for the MGIS program, the Department will accept a four-year BA or BSc degree in Geography or in any related field that makes use of spatial data. Examples include, but are not limited to: Anthropology, Archaeology, Biological Sciences, Computer Science, Ecology, Environmental Science, Geology/Geophysics, Geomatics Engineering, History, Management, Mathematics, Political Science, Psychology, Tourism, Transportation Studies or Engineering, and Urban Studies.

3. Application Deadline

Deadlines for submission of complete applications:

For thesis programs
January 15 for September admission
August 15 for January admission

For MGIS applicants
April 30

Files are reviewed on an ongoing basis. Applications are accepted until the deadline, but late applications may be considered if there is capacity in the program.

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements

In addition to Faculties of Graduate Studies and Arts requirements, the Department requires the following:

Master of Geographic Information Systems

Ten half courses, eight at the 600 level or higher, must be completed while in the program. These will include:

a) Three core courses in Geographic Information Sciences in the areas of Remote Sensing, Spatial Analysis and Geographic Information Systems:

Geography 633 Research and Applications in Remote Sensing
Geography 639 Advanced Spatial Analysis and Modeling
Geography 647 Advanced Research and Applications in Geographic Information Systems

Each course assumes that the student has two undergraduate courses in the areas of Remote Sensing, analytical methods in Geography (or inferential statistics) and Geographic Information Systems, respectively.

b) Two research-based courses related to the area of Geographic Information Science:

Geography 681 GIS Project: Theoretical Issues
Geography 683 GIS Project: Application

These courses will be on a topic mutually agreed upon between the student and the supervisor. The first course will be concerned with gathering information and literature on the research topic and will provide a critical assessment of this literature. This will be written up as a course paper that will equate to the literature review chapter of a traditional thesis. The second research course will be concerned with carrying out a program of analysis in the chosen research area using the Geographic Information Science tools discussed in the core courses. The final paper produced for this course will equate to the analysis and discussion chapters of a traditional thesis.

c) Five additional half courses chosen by mutual agreement between the student and the supervisor. These courses will support the student’s chosen research project and understanding of the Geographic Information Sciences.

The MGIS program may be completed on a full-time or a part-time basis.

Master of Arts, Master of Science Requirements for the MA and MSc degrees:

a) Four half-course equivalents in a two-year period, including History and Philosophy of Physical or Human Geography, at least one of the core Geography Graduate Seminars, and at least one Methods course.

b) An approved thesis proposal completed within the first year of the program.
Program Descriptions

For detailed information on courses and program requirements please refer to: http://www.geog.ucalgary.ca/.

Full-time status is expected. In some situations thesis programs may be completed on a part-time basis with approval from the Graduate Coordinator.

Doctor of Philosophy

Requirements for the PhD degree:

a) Two half-course equivalents during the first two years in program, including at least one of the core Geoscience Graduate Seminars.

b) An approved thesis proposal completed within the first 18 months of the program.

c) A candidacy exam completed within the first 24 months of the program.

For detailed information on courses and program requirements please refer to: http://www.geog.ucalgary.ca/.

Full-time status is expected. In some situations thesis programs may be completed on a part-time basis with approval from the Graduate Coordinator.

6. Additional Requirements

For thesis programs: participation in the graduate research seminar series and the annual Department Conference.

For MGIS students: Participation in the annual graduate student Department conference (oral presentation or development of an academic poster of their project work for presentation/display).

Departures from regular departmental program/ course requirements may be recommended on an individual basis by the interim advisor or supervisor with approval from the Graduate Coordinator.

7. Credit for Undergraduate Courses

No more than one half of a regular thesis graduate student's coursework can be at the undergraduate level. Programs requiring a larger ratio of undergraduate courses must receive approval of the Dean of Graduate Studies at the time of admission. MGIS students are allowed a maximum of one full course credit at the 500 level.

8. Time Limit

Expected completion time is two years in MA/MSc programs and four years in the PhD program. Maximum completion time is four years for MA/MSc programs and six years for the PhD program. For the MGIS Program, minimum completion time is one year and maximum completion time is six years.

9. Supervisory Assignments

Each graduate student has a supervisor appointed within the first term in program. For PhD students, a supervisory committee should be appointed within three months of the appointment of supervisor.

10. Required Examinations

MGIS oral comprehensive examinations will be based on project and course work. MGIS students will be examined on their comprehensive understanding of course material and their integrated professional knowledge/concept of geographic information science. The examination committee will consist of at least three examiners, including the graduate student advisor, but with no requirement for an external examiner.

PhD candidacy examinations have a written and an oral component. Questions on the research proposal will not be included in the oral candidacy examination. Final thesis oral examinations are open.

11. Research Proposal Requirements

See Program/Course Requirements.

12. Special Registration Information

None.

13. Financial Assistance

Department funding is available to highly ranked thesis students. Financial assistance may be available to qualified thesis students. For information on awards, see the Awards and Financial Assistance section of this Calendar or check the Graduate Awards Database: http://www.grad.ucalgary.ca//fundings.

Unless otherwise stated, awards are made only to full-time students in thesis programs.

14. Other Information

None.

15. Faculty Members/Research Interests

Faculty members and their research interests can be found at http://www.geog.ucalgary.ca/index.cfm?page=people&style=1&mode=1.

Geoscience GLGP

Contact Information

Location: Earth Sciences Building, Room 118
Department number: 403.220.3254
Fax: 403.284.0074
E-mail address: geosciencegrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/geoscience

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based or course-based

The course-based Master of Science degree may be taken on a full-time or a part-time basis.

The Master of Science degree is also offered with specialization in Reservoir Characterization (Interdisciplinary). For further information on this specialization, see the separate listing in this Calendar.

2. Admission Requirements

In addition to Faculties of Graduate Studies and Science requirements, the Department requires:

Master of Science

a) Normally, a four-year Bachelor of Science degree or equivalent. An Honours degree in geology or geophysics, or a field related to geophysics, such as physics or mathematics, is preferred.

b) A concise statement outlining the applicant’s research interests and reasons for wishing to attend the University of Calgary.

c) For those students required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test), 92 (Internet-based test), a MELAB score of 82, an IELTS score of 7.5, or a PTE score of 64;

d) Two reference letters.

Doctor of Philosophy

a) Normally, a Master of Science degree or equivalent in geology or geophysics or a field related to geophysics, such as physics or mathematics;

b) A concise statement outlining the applicant’s research interests and reasons for wishing to attend the University of Calgary;

c) For those students required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test), 92 (Internet-based test), a MELAB score of 82, an IELTS score of 7.5, or a PTE score of 64;

d) Two reference letters.

3. Application Deadline

Deadlines for complete applications:

February 1 for September admission
January admission is considered on a case-by-case basis and applications must be received by September 1.

4. Advanced Credit

Thesis-based programs: Application for credit should be made to the graduate program at the time of admission, so that the graduate program can take previous work into account when specifying a student's program.

Course-based programs: The student must request advanced credit in writing at the time of application for admission.

Masters programs: The total of advanced credit and transfer credit will generally not exceed either one-third of the program or two full-course equivalents, whichever is less.

Doctoral programs: Credit for relevant courses taken during the Master of Science program may result in the reduction of the required four course minimum for doctoral students. Credit may be granted for a maximum of three half courses for students with Master of Science degrees from the Department of Geoscience at the University of Calgary, and two for students with Master of Science degrees from elsewhere.

Advanced credit is not guaranteed and will be determined by the Graduate Coordinator or Department Head with consideration
of the recommendation of the Interim Supervisor. Courses for which advanced credit is being sought must be from a recognized institution and not have been used for any degree or diploma accreditation. They must be graded, graduate level courses, and the graded level of performance must be equivalent to a "B" grade or higher standing at the University of Calgary. Advanced credit is not normally given for courses taken more than five years before admission to the current graduate degree program or for courses taken for the purposes of qualifying for admission.

5. Program/Course Requirements

In addition to the Faculties of Graduate Studies and Science requirements, the Department requires:

**Master of Science (course-based)**

a) Nine half courses, five of which must be at the 600 level or higher (includes Geology 701 or Geophysics 701 research project)
b) Completion of a Research Project (Geology 701 or Geophysics 701). The student is required to present and defend the project in a one-hour defense once the written research report is in near-final form. The supervisor and two other members of the department assess the project. If a company is involved the company supervisor may also assess the project.
c) Completion of at least six half courses in the first year of study by full-time students, and at least one half course in the first academic session by part-time students. Following is a list of required courses for the two concentration areas that are offered.

**Geology Course-based Concentration**

a) Geology 707

b) At least seven additional geology or geophysics courses at the 500 or 600 level. At a minimum, three must be at 600-level. Up to four appropriate courses from another department may be substituted for a 500-level geology or geophysics course subject to program approval. Course-based students may receive credit for both Geology 703 and 701. Courses are selected in consultation with the supervisor and with the approval of the graduate coordinator.
c) Geology 701. This course constitutes the research component of the degree and cannot be submitted and defended until after all other courses are completed.
d) Students with deficiencies may be required to take more than nine half courses upon the advice of their supervisor.

**Geophysics Course-based Concentration**

a) Four of the following: Geology 707, Geophysics 547, 551, 557, 657, 659.
b) At least four other Geophysics courses at the 500, 600 or 700 level. At least four of the eight required courses must be at the 600 or 700 level. One or two appropriate courses from another department may be substituted for a 500-level geology or geophysics course subject to program approval. Course-based students may receive credit for both Geophysics 703 and 701. Courses are selected in consultation with the supervisor and with the approval of the graduate coordinator.
c) Geophysics 701. This course constitutes the research component of the degree and cannot be submitted and defended until after all other courses are completed.
d) Students with deficiencies may be required to take more than nine half courses upon the advice of their supervisor.
e) Geophysics 703. This course constitutes the research component of the degree and cannot be submitted and defended until after all other courses are completed.

9. Supervisory Assignments

Upon admission, a student is assigned an interim supervisor by the Graduate Coordinator. The interim supervisor is chosen from the research field the student has specified. Usually the interim supervisor becomes the permanent supervisor, but the Graduate Coordinator must approve the final selection before the thesis proposal is submitted. Supervisory committees for doctoral students are selected by consultation between the permanent supervisor and the student.

10. Required Examinations

Final thesis oral examinations are open with a public presentation on the same day. Questions on the research proposal may be included in the oral candidacy examination. Students should contact their department for further details.

11. Research Proposal Requirements

Master of Science thesis-based students must file a thesis proposal by March 15 of the second session of study for September registrants and July 1 for January registrants. The thesis proposal must not be more than five pages of text long and include an abstract and a list of references cited in the text. The supervisor will assess the proposal in detail.

Ph.D. thesis students will submit a more substantial thesis proposal within 18 months of registration.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this calendar.

Students applying for scholarships must submit their applications to the Department by February 1.

No financial support will be given to students enrolled in the course-based Master's program.

14. Other Information

The department requires all graduate students to file a comprehensive Annual Report. The report is due by December 15 and covers activities for the current calendar year. Recent September registrants are required to report activities for their first term of study only.

No office space will be provided to students enrolled in the course-based Master's program.

Detailed information about the graduate program can be found at departmental web site.

15. Faculty Members/Research Interests

The current faculty research interests can be found at http://www.geoscience.ucalgary.ca/faculty_directory2.
Germanic, Slavic and East Asian Studies GSEA

Contact Information
Location: Craigie Hall, C Block, Room 205
Faculty number: 403.220.5293
Fax: 403.284.3810
E-mail address: gsea@ucalgary.ca
Web page URL: http://gsea.ucalgary.ca/

1. Degrees and Specializations Offered
Master of Arts degree (thesis-based) in German
The Department particularly solicits applications from students interested in pursuing a cross-disciplinary degree involving another department at the University of Calgary (e.g., English; History; Linguistics; Philosophy; French, Italian and Spanish). Applicants interested in an interdisciplinary doctoral program with a German Studies component on a special case basis should contact the Department. The Department does not formally offer a part-time option – all students will be considered full-time.

2. Admission Requirements
In addition to the requirements of the Faculties of Graduate Studies and Arts, the Department of Germanic, Slavic and East Asian Studies requires:

a) A letter of intent outlining background, research interests, and goals for the program
b) An academic writing sample (of approximately 8-15 pages) in English or German
c) Two reference letters

3. Application Deadline
Deadlines for the submission of complete applications:
- February 1 for September admission
- September 1 for January admission (discuss January admission with Department)

Late applications reduce the applicant’s chances of receiving funding

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to the Faculty requirements, the Department requires:

a) Normally, three full-course equivalents for students who hold a baccalaureate degree
b) For some students, depending upon background preparation, a course in bibliographic and methodology
c) Sufficient German language skills for the proposed program

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
No more than one-half of a regular graduate student’s required program of course work can be at the undergraduate level. Undergraduate courses may only be taken for credit only with departmental approval. Programs requiring a larger ratio of undergraduate courses must receive the approval of the Dean of Graduate Studies at the time of admission. Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599.

8. Time Limit
Expected completion time is two years for the Master of Arts and four years for the Doctor of Philosophy. Maximum completion time is four years for the Master of Arts and six years for the Doctor of Philosophy.

9. Supervisory Assignments
The Graduate Program Director is normally the interim supervisor for students entering the program, and will assist them in finding a supervisor within the first year. In the case of cross-disciplinary degrees, the choice of supervisor must be established upon application to the program.

10. Required Examinations
Final thesis oral examinations are open. Questions on the research proposal will not be included in the oral candidacy examination of special case doctoral degree students.

11. Research Proposal Requirements
The department requires all graduate students to submit a written thesis proposal by the sixteenth month of the program. The required form is available on the department website. The proposal should be drafted after consultation with the student’s supervisor and have his/her preliminary approval.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Department by February 1.

14. Other Information
None.

15. Faculty Members/Research Interests
Research faculty and the specific areas within which Master of Arts thesis supervision is offered may be found at http://gsea.ucalgary.ca/graduate/faculty-members-german. Please refer to the Course Listing in the Main Calendar: http://www.ucalgary.ca/pubs/calendar/current/german.html.

Greek and Roman Studies GRST

Contact Information
Location: Social Sciences Building, Room 506
Faculty number: 403.220.5537
Fax: 403.220.9581
Contact List: See http://grst.ucalgary.ca/contact
Web page URL: http://grst.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA) degree, thesis or course-based (full or part time)

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

a) Normally at least eleven full-course equivalents of relevant undergraduate course work are expected for admission to the MA program, with some concentration in the proposed research area;
b) All research areas require proficiency in reading Latin and/or Greek;
c) Competence in reading French, German or Italian must be acquired either before or during the program;
d) For the PhD, an MA is required;
e) Two letters of reference.

3. Application Deadline
Deadlines for submission of complete applications:
- February 1 for September admission (when accompanied by a graduate scholarship application)
- April 1 for September admission (with no scholarship application)
- September 1 for January admission

4. Advanced Credit
Contact department for information.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts (thesis-based, full or part-time)

a) Greek and Roman Studies 603, first-year half course on research and professional training
b) Four other seminar half courses, normally taken in the first year of the program; these may include up to two half courses outside the department if appropriate to the area of specialization
c) Four quarter courses of directed studies in Greek and Latin texts (Greek or Latin 607), normally taken in Fall and Winter Terms of the first and second year
d) An examination in translation, with dictionary, from French or German or Italian into
English (normally to be attempted within the first twelve months of registration)
e) A thesis of approximately 20,000 words, with oral examination

Master of Arts (course-based, full or part-time)
a) Greek and Roman Studies 603, first-year half course on research and professional training
b) Eight other seminar half courses; these may include up to two half courses outside the department if relevant to the student’s particular interests in the field
c) Four quarter courses of directed studies in Greek and Latin texts (Greek or Latin 607), normally taken in Fall and Winter Terms of the first and second year
d) An examination in translation, with dictionary, from French or German or Italian into English (normally to be attempted within the first twelve months of registration)

Doctor of Philosophy
a) Greek and Roman Studies 603, first-year half course on research and professional training;
b) A minimum of four other graduate seminar half courses; these may include up to two half courses outside the department if appropriate to the area of specialization;
c) Four quarter courses of directed studies in Greek and Latin texts (Greek or Latin 607);
d) A translation examination from two of the three following modern languages into English, French, German or Italian;
e) Examination of the Core Reading and Dissertation Reading List (contact the department for further information);
f) A twenty-page dissertation proposal;
g) A Candidacy Exam, which must be passed before 28 months of tenure;
h) A thesis of about 75,000 words, followed by an oral examination.

6. Additional Requirements
The department may require up to two half courses of additional directed studies in order to ensure sufficient preparation in relevant areas for the MA. Students are advised of any such requirements upon entry into the program.

7. Credit for Undergraduate Courses
Not more than two of the half courses required in the thesis-based MA program, and not more than four half courses in the course-based program, may be taken at the 500 level.

8. Time Limit
Students studying on a full-time basis are expected to complete the program in two years. Students in thesis-based Master’s programs must complete their degrees within four years. Students in course-based Master’s programs must complete their degrees within six years. For the PhD program, students are expected to complete their degrees within six years.

9. Supervisory Assignments
The Graduate Program Coordinator is normally the interim supervisor for a Master’s student entering the program, and will assist the student to find a supervisor within eight months of entering the program. Doctoral students are expected to have a supervisor upon entry. The appointment of a supervisor is subject to approval by the Department Head.

10. Required Examinations
Final oral examinations are open. Questions on the research proposal will not be included in the oral candidacy examination.

11. Research Proposal Requirements
A formal proposal is not required for the MA thesis. The student’s thesis topic is defined in consultation with the supervisor, normally within 12 months of entry into the program. It should be referred to the Program Graduate Program Director for approval. The PhD proposal is to be submitted in accordance with the Faculty of Graduate Studies requirements.

12. Special Registration Information
None.

13. Financial Assistance
The department offers full or partial support through teaching assistantships and Faculty of Graduate Studies Support to selected applicants. The Faculty of Graduate Studies offers numerous awards listed in the Graduate Calendar (e.g. Open Scholarships) in a university-wide competition.

Application forms are included in the admission application package and linked to the online admission application.

Various awards are available from other agencies (federal and provincial governments, private foundations, etc.). Applicants are encouraged to seek funding vigorously. The department can offer advice on identifying sources.

Note: Faculty of Graduate Studies Support and university scholarships are normally awarded only to students in the thesis-based program.

14. Other Information
Enquiries should be addressed to: Graduate Program Coordinator, Department of Greek and Roman Studies, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 (See http://grst.ucalgary.ca/contact). Inquiries should be addressed to: Graduate Program Coordinator, Department of Greek and Roman Studies, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4 (See http://grst.ucalgary.ca/contact).

15. Faculty Members/Research Interests
Details concerning the research areas of individual professors may be obtained from the department website at http://grst.ucalgary.ca/contact-us/directory.

Haskayne School of Business: Management MGMT

Contact Information
Location:
MBA Program: Scurfield Hall, Room 350
PhD Program: Scurfield Hall, Room 332
Phone:
MBA Program: 403.220.3808
PhD Program: 403.220.3803
Fax: 403.282.0095
E-mail address:
mbarequest@haskayne.ucalgary.ca
phdrequest@haskayne.ucalgary.ca
Web page URL: http://www.haskayne.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Business Administration (MBA), course-based and thesis-based Specializations:

*Specializations are currently not available within the Executive or Global Energy Executive delivery format of the MBA program.

Combined programs, offered with other Faculties:
- Juris Doctor/Master of Business Administration (JD/MBA)
- Master of Social Work/Master of Business Administration (MSW/MBA)
- Master of Biomedical Technology/Master of Business Administration (MBT/MBA)
- Doctor of Medicine/Master of Business Administration (MD/MBA) (*Leaders in Medicine* Program)

Combined programs, offered with professional societies:
- MBA-CMA Program
- MBA-CGA Program

This is a combined initiative between the Haskayne School of Business and the Certified General Accountants of Alberta. This program is intended for those with a strong undergraduate background and several years of relevant work experience. Students must complete the CMA prerequisites and the CMA national entrance exam before being admitted to the MBA-CMA program. Students can complete the requirements for the Haskayne MBA and the CMA designation in three years of part-time study. For information and application materials for this program, please visit http://www.cma-alberta.com.

MBA-CGA Program
This is a combined initiative between the Haskayne School of Business and the Certified General Accountants of Alberta. Students accepted to the MBA program may complete several requirements of the CGA
Program Descriptions

designation as part of their MBA program. For information check with the Haskayne MBA office or with https://www.cga-alberta.org/.

Master of Business Administration (course-based)
The course-based MBA program is designed for students who wish to pursue a career in management and is offered to students who possess a four-year degree or equivalent in any discipline. The program consists of required courses designed to create integrative business skills and elective courses where students have the opportunity to pursue areas of specialization. Students can complete the Haskayne MBA through full-time study that normally requires 16 to 20 months, or through evening study with completion in two to six years.

Normally, combined programs (JD/MBA, MSW/MBA, MBT/MBA, MD/MBA) must be completed on a full-time basis. Students in the Haskayne MBA program may choose a specialization in Finance, Entrepreneurship and Innovation, Marketing, Global Energy Management and Sustainable Development or Project Management. They may also elect not to have an area of specialization.

Executive MBA
The Executive MBA is offered jointly by the University of Calgary and the University of Alberta on alternate weekends and periodic intensive weeks. It is designed for those who wish to participate in an intensive MBA study program while still continuing actively in their careers.

Global Energy Executive MBA
The Global Energy focused delivery of the Executive MBA maintains the core content of the MBA program and the alternative scheduling of the EMBA that is more conducive to executives who remain active in their career. The MBA curriculum is enhanced by collaboration with IHS Cambridge Energy Research Associates (IHS CERA) allowing greater emphasis on energy-focused business and presents that material from a global perspective. The material is delivered through five distinct learning modules, each conducted over a period of three to five months. These modules feature intensive two- to three-week residencies providing real-world experiences in international energy centres.

Master of Business Administration (thesis-based)
This program of studies is designed for students wishing to pursue a special research interest in the Haskayne School of Business. It is normally offered to students who possess a Bachelor of Commerce degree or its equivalent. The thesis program will admit only those students who can demonstrate a serious commitment to research, the ability to work independently in the production of a thesis, and a qualified supervisor who is interested in overseeing their research program.

Doctor of Philosophy
The Doctor of Philosophy program offers talented research-oriented students the opportunity to pursue an academic career in business-related subjects.

2. Admission Requirements
Master of Business Administration and Master of Project Management
In addition to the Faculty of Graduate Studies requirements, the MBA and MPM programs require:

a) A current résumé.

b) A 250-word response to each of “How, considering your career progress to date, does an MBA fit in with your future career goals?” and “When thinking of your own personal successes, were they a result of your own personal skills or your ability to work with others? Please describe”.

c) For students required to prove proficiency in English, a minimum TOEFL score of 600 (written test), or 100 (Internet-based test), or an IELTS score of 7.0, or a MELAB score of 84, or a PTE score of 70.

d) Completion of the Graduate Management Admission Test (GMAT®) with a recommended minimum score of 550 for the Haskayne MBA with high scores on both verbal and quantitative subcomponents. It is recommended that students should place above the 70th percentile on overall test scores. A minimum GMAT score of 600 or an equivalent GRE is required for the thesis program.

e) Two reference letters.

f) For course-based programs only, the equivalent of at least 3 years of appropriate work experience.

g) For applicants to the thesis-based program, normally a Bachelor of Commerce with a minimum grade point average of 3.30 on a four-point scale.

h) For applicants to the Executive MBA (EMBA) and the Global Energy Executive MBA (GEEMBA) delivery formats, the equivalent of at least seven years of work experience, a number of years of which must have carried management or professional responsibility.

i) Applicants to the Global Energy E-MBA (GEEEMBA) delivery format of the MBA must be eligible to travel internationally.

j) Applicants may be interviewed by a member of the Admissions Committee as part of the application screening process.

k) An applicant to a combined MBA program (JD/MBA, MSW/MBA, MBT/MBA, MD/MBA) must be admitted to the MBA program, and make separate application for admission to the other program. The respective Combined Program Committee will review each application. Normally, only a full-time student in the Haskayne MBA Program may take a combined program.

Please note that receiving admission to both individual programs does not guarantee admission to the combined program.

Note: An applicant who has completed a Bachelor’s degree with an admission grade point average (GPA) from 2.50 to 2.99 may be admitted to an MBA course-based program as a regular student on the basis of the following equivalent achievement score: [(GPA x 200) + GMAT] 1150.*

*Consult the Haskayne School of Business about the Graduate Management Admission Test.

Doctor of Philosophy
In addition to the Faculty of Graduate Studies requirements, the Haskayne School of Business requires:

a) Normally, an MBA degree or equivalent from a recognized institution with a recommended minimum admission grade point average of 3.50 on a four-point scale.

Students with an undergraduate or Master’s degree in an area other than business may be required to complete a qualifying period to gain a general business background before beginning the normal doctoral course requirements.

It is possible to enter the PhD program without an MBA or other Master’s degree. Consult the Director of the PhD Program for further information.

b) A score of at least 600 on the Graduate Management Admission Test (GMAT) with high scores on both verbal and quantitative subcomponents; or equivalent results on the Graduate Record Exam (GRE). It is recommended that students should place above the 85th percentile on overall test scores.

Most PhD applicants in the recent past have obtained above 650 on the GMAT, with many successful applicants having earned scores of 700 and above.

c) For those students required to prove proficiency in English, a minimum TOEFL score of 600 (written test), or 100 (Internet-based test), or an IELTS score of 7.0, or a MELAB score of 84, or a PTE score of 70.

d) Two reference letters.

e) A personal statement outlining objectives, intent and commitment to a research program.

f) Availability of a research-active supervisor and resources for the area in which the student wishes to study.

Work experience in business or public organizations will be considered.

See the PhD program website http://haskayne.ucalgary.ca/haskaynegrad/phd for more information. Approved changes to the program standards and requirements will be posted on the website.

3. Application Deadline
March 1 for international applicants (September admission) Refer to website for other deadlines.

PhD and MBA (thesis-based) programs
January 15 for September admission - year-round admission assessment and decision possible for exceptional students with complete applications.

Combined programs
As separate application to applicable program is required, please see relevant program for deadlines.
4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process to the MBA program. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

Course requirements for doctoral students will be based on the student’s background and program needs. Credit for previous courses will be provided as appropriate.

5. Program/Course Requirements
In addition to the requirements of the Faculty of Graduate Studies, the Haskayne School of Business requires:

MBA (course-based)
The MBA degree normally consists of twenty half courses (nineteen half courses and two quarter courses effective July 1, 2010). Students may be granted exemption from first-year courses based upon prior academic preparation and with the approval of the Associate Dean (MBA Program). Students must complete a minimum of fifteen half courses (or equivalent), of which a maximum of five half courses may be transfer credit from another recognized graduate program, for the MBA degree.

First Year Courses
Accounting 601 Financial Accounting
Accounting 603 Management Accounting
Finance 601 Managerial Finance
Human Resources and Organizational Dynamics 601 Managing Human Resources
Management Information Systems 601 Management Information Systems
Management Studies 611 Managerial Economics
Management Studies 613 Managerial Decision Modelling
Marketing 601 Marketing Management
Operations Management 601 Operations Management
Strategy and Global Management 601 Strategic Management
Management Studies 790.01 MBA Skills

Second Year Courses
The MBA degree requires the following integrative courses:
Management Studies 715 Strategic Business Analysis
Business Environment 777 Global Environment of Business
Management Studies 790.02 Leadership Capstone

Areas of Specialization
Students must complete seven elective half courses beyond the first year and integrative courses. Students may select an area of specialization normally consisting of four half courses. Students wishing to specialize may choose from the following areas:
- Finance
- Entrepreneurship and Innovation
- Marketing
- Global Energy Management and Sustainable Development
- Project Management

Students who elect not to choose an area of specialization may choose instead from various graduate courses offered by the Haskayne School of Business. Subject to the approval of the Associate Dean (MBA Program) and the Faculty of Graduate Studies, graduate courses offered at the University of Calgary outside the Haskayne School of Business may also be taken.

Combined JD/MBA
A student admitted to the combined JD/MBA program spends the first year doing core studies in one program and the second year doing core studies in the other program. The remaining years in the program combine Law and Business courses in a way that will allow the achievement of both degrees in four rather than five years (please consult the MBA office).

Combined MSW/MBA
A student admitted to the combined MSW/MBA program will require an undergraduate degree in Social Work (BSW) or equivalent. The MSW/MBA degree can be completed in two years of study (24 months) including fall/winter and spring/summer sessions (please consult the MBA office).

Combined MBT/MBA
A student admitted to the combined MBT/MBA program will require an undergraduate degree in Biological Sciences or equivalent.

Combined MD/MBA
A student admitted to the MD/MBA program will be required to hold an undergraduate degree and be admitted to both the MD and MBA programs. A program will be developed for each student under the guidelines of the Leaders in Medicine program (please consult the MBA office).

Executive MBA
The delivery format of the program is different from the Haskayne MBA program and requires more integrative types of sessions and activities. However, the program requires many of the same courses as are required in the Haskayne MBA program. In general, students in this program are expected to follow a general curriculum rather than electing an area-specific specialization other than the specialization in Global Energy Management. Only in rare cases will it be possible for students to do the latter.

It is expected that all participants entering the program in a given year will complete the program requirements at the same pace, completing all of them over the same 21-month time frame.

Global Energy Executive MBA delivery format (GEEMBA)
The delivery format of the program is different from the Haskayne MBA and Executive MBA programs. Course delivery will include more integrative types of sessions and activities, offered in modules in a variety of locations. The course content of the MBA required courses above, will be completed through the alternative delivery format with the added benefits of the networking and alternative scheduling for business career professionals and a real-world global experience with international travel. It is expected that all participants entering the program in a given year will complete the program requirements at the same pace, completing all of them over the same 19-month time frame.

MBA (thesis-based)
a) A minimum of eight half-course equivalents selected by the student in consultation with his or her supervisor. Among these eight half courses, a course in research methods (Management Studies 773, Multivariate Analysis in Management) and one Strategy and Global Management course Business and Environment 777, Strategy and Global Management 601, or 795 are required. MBA Thesis students are also invited and encouraged to take one or more doctoral-level courses as part of their programs.
b) Approval of each individual's program by the Director, MBA (thesis-based) Program.

Students who lack courses in one or more of the functional disciplines in management (i.e., accounting, finance, human resources and organizational dynamics, management information systems, operations management, marketing) may be required to take courses in those areas in partial fulfillment of their program either as part of, or in addition to, the normal eight half course requirement.

Doctor of Philosophy
Each student will have four areas of study. The first area (Management Studies – MGST) will be an overview of management education, theory, and research methods. The second will be designated as the major area; the third as the minor; and the remaining area is analytical methods.
a) Management Studies Area – A number of half courses, such as Management Studies 781, 783, 791, 792, and 793. Students who have not completed a research-based Master's degree should take Management Studies 792 during the spring/Summer Sessions between their first and second years.
b) Major area: The major area must be chosen from those offered within the Haskayne School of Business:
- Accounting
- Entrepreneurship and Family Business Management
- Environmental Management/Sustainable Development
- Finance
- Human Resources and Organizational Dynamics
- Management Information Systems
- Marketing
- Operations Management
- Risk Management and Insurance
- Strategy and Global Management
- Tourism Management

Students will be required to take three or four half courses from the major area.
Program Descriptions

6. Additional Requirements
Attendance at an orientation session is mandatory for all incoming students in all MBA program options and for all incoming doctoral students.

7. Credit for Undergraduate Courses
Credit for undergraduate courses taken prior to admission may be granted based on the approval of the Associate Dean (MBA Program).

8. Time Limit
Thesis-based Master: five years
Course-based Master: six years
Doctor of Philosophy: six years
MSW/MBA: seven years
Note: It is expected that all participants entering the Global Executive Delivery format of the MBA program in a given year will complete the program requirements at the same pace, completing all of them over the same 19-month time frame.

9. Supervisory Assignments
Doctoral and MBA (thesis-based) students are required to select a permanent supervisor within the first twelve months of their program. For doctoral students, a supervisory committee reflective of the student’s research interests is required within three months after the permanent supervisor has been approved.

10. Required Examinations
Doctoral students are required to complete written candidacy examinations developed by the supervisory committee within twenty-eight months of commencing the program. These often combine take-home examinations and an oral examination completed within a period of one month. Questions on the research proposal may be included in the candidacy exam. The written candidacy examination format may differ depending on the major area and the supervisory committee. Students are advised to consult with their supervisors at least six months in advance of the candidacy examination dates.

MBA thesis and doctoral students are required to complete an oral thesis examination at the end of their programs.

11. Research Proposal Requirements
Students whose research involves human subjects must receive approval from the Haskayne School of Business and from the University of Calgary Conjoint Faculties Research Ethics Board before beginning data collection. Doctoral students are required to have an acceptable research proposal before the doctoral candidacy examination. MBA (Thesis) students must secure approval from the supervisor before beginning thesis research.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, please see the Awards and Financial Assistance section of this Calendar. MBA Thesis and doctoral students applying for scholarships must submit their applications to the Program Director by January 15. The Haskayne School of Business provides assistance for doctoral students in the form of Graduate Assistantships, Faculty of Graduate Studies Scholarships, the Robert Willson Scholarship, and the Marion Janet and Ian Stormont Forbes Graduate Scholarship. Students should also enquire about scholarships available from the Faculty of Graduate Studies. All admitted full-time MBA students will be automatically considered for Business scholarships.

14. Other Information
Successful applicants will be required to confirm their acceptance of an offer of admission into the MBA program by sending a non-refundable $500 deposit to the Haskayne School of Business. The $500 will be credited toward fees upon registration.

15. Faculty Members/Research Interests
The active research interests of the faculty can be found at http://www.haskayne.ucalgary.ca/faculty/dir/faculty/.

History
Contact Information
Location: Social Sciences Building, Room 656
Faculty Number: 403.240.3839
Fax: 403.289.8566
E-mail address: histgrad@ucalgary.ca
Web page URL: http://hist.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), course-based and thesis-based
Candidates should apply to the program of their choice, indicating the area of specialization (see section 5 below).

2. Admission Requirements
In addition to the requirements of the Faculties of Graduate Studies and Arts, the Department requires:

Master of Arts
a) Normally, a four-year undergraduate program with honours or a major in history. Usually this entails at least seven full-year History courses (or fourteen half courses). Credit may be given for up to two half courses in other disciplines, if appropriate for the proposed area of study;
b) A minimum admission grade point average of 3.40 on a four-point scale over the final 10 full-course equivalents of the undergraduate degree;
c) A copy of a historical research paper, preferably graded, normally at the senior undergraduate level;
d) A 250-word (minimum) statement of research interest including research topics in the major field and the reasons for pursuing a post-graduate degree in history;
e) Two reference letters.

Doctor of Philosophy
a) Normally, a completed four-year undergraduate program with honours or a major in history and a completed Master’s degree or the equivalent in history or in a related discipline;
b) A grade point average of 3.70 on a four-point scale in history at the graduate level;
c) A detailed statement of research interests, career goals, and ideas for the thesis topic;
d) A sample of written work, normally a Master’s thesis chapter or a major research paper completed at the Master’s level;
e) Two reference letters.

3. Application Deadline
Deadlines for the submission of complete applications:
January 15 for September admission and funding
April 15 for September admission only

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/ Course Requirements
In addition to the requirements of Graduate Studies and Arts requirements, the Department requires:

Master of Arts (thesis-based)
a) A minimum of one year of full-time study at the University of Calgary.
b) Three full-course equivalents (including History 680) in two semesters of coursework. Masters students will complete their coursework through regularly offered History seminars.

Areas of faculty research interests include:
Canada, Europe, Israel Studies, Latin
Program Descriptions

America, United States, Britain, Imperial India, China, Atlantic History, History of Science, Intellectual History, Military-Diplomatic History, Political History, Popular Culture, Religious History, History of Gender and Sexuality, Social History, and Western Canada/Borderlands/Frontier.

Students in the Departments of History, Political Science, Religious Studies and the Centre for Military and Strategic Studies may choose an interdisciplinary specialization in Israel Studies. For further information on the Israel Studies (interdisciplinary) specialization, see the separate listing in this Calendar.

In cooperation with the Department of Philosophy, the History Department offers a Masters of Arts degree in the History and Philosophy of Science. Students who choose this concentration are required to take courses in the relevant departments. Candidates enrolled in the Department of History are expected to work with more than one instructor in History.

Students must take one half course seminar in a field unrelated to the student's research interests. In instances where there are no seminars being offered in the student's research field, students may, with permission of the chair of graduate studies, take one 500-level undergraduate seminar but on the understanding that extra course work will be required.

The Graduate Studies Committee may vote to allow students to enrol in History 691 directed reading courses after reviewing a written request from the student's supervisor.

c) A thesis of 80 to 150 pages, including notes, charts, tables and appendices, but excluding bibliography. Students begin thesis preparation as they undertake their coursework relevant to the primary and secondary areas as well as his or her particular field of research. The secondary area will be selected from an area outside of History. A cognate course will consist of a non-history discipline or thematic history subject. The length of the reading list will be 100-150 titles for the primary area (with the understanding that the three articles or stand alone chapters in essay anthologies is the equivalent of one book), and 50-75 titles for the secondary area. The availability of secondary areas and cognate thematic courses will depend on faculty members' expertise. Each of a student's areas must be taught by a different faculty member or as defined by the committee.

Primary Areas: Canada; History of Science, Latin America; Medieval and Early Modern Europe; Military/Diplomatic Modern Europe and Britain; United States; World.

Secondary Areas (to be chosen from outside of Primary Area): Canada; History of Science; Latin America; Medieval and Early Modern Europe; Military/Diplomatic Modern Europe and Britain; United States; World.

Cognate Course: Students will complete one half course of graduate level coursework in an area outside of History. A student's cognate course will be determined in consultation with the supervisor.

c) A thesis normally of 400 pages, including notes, charts and tables, but excluding bibliography and appendices.

d) A reading knowledge of one language other than English.

e) Written and oral candidacy examinations in primary and secondary areas. The Supervisory Committee consists of the primary and secondary area supervisors with the third member being a faculty member whose area of expertise is in the field of study for the student. The History Department urges candidates to take candidacy examinations within 16 months of first registration. Examinations must be completed within 20 months of first registration.

The doctoral program consists of two terms of coursework relevant to the primary and secondary areas, and cognate course. During the third and fourth terms, students read for the candidacy examinations. Four to five terms of thesis preparation will normally follow. Students who have not taken History 690 or its equivalent will be required to take it as part of their program in the first year and in addition to the requirements above.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Students enrolled in the part-time course-based Master of Arts program may take two of the required six full-course equivalents at the 500 level.

Students enrolled in the Master of Arts thesis program may apply for no more than one 500-level course for graduate credit, subject to the approval of the Department. Graduate students taking a 500-level course for graduate credit will be required to complete additional assignments.

8. Time Limit
Expected completion time is 12 to 20 months for the Master of Arts thesis program, and four years for the doctoral program. Maximum completion time is four years for the Master of Arts thesis program and six years for the course-based Master of Arts and doctoral programs.

9. Supervisory Assignments
Upon acceptance into the program, students are assigned an interim supervisor. Each student should select a permanent supervisor, subject to the consent of the faculty member, within three months of entering program. Admission to the Master's and the doctoral programs is dependent upon the agreement of a faculty member to supervise in an interim capacity.

The supervisor establishes a doctoral supervisory committee in consultation with the student. The Supervisory Committee consists of the primary and secondary area supervisors with the third member being a faculty member whose area of expertise is in the field of study for the student. The supervisory committee must be selected within three months of the supervisor's appointment (no later than March of the first year of a program).

10. Required Examinations
Doctoral candidacy examinations have a written and an oral component and are taken upon completion of all course and language requirements. Students will write exams for their primary and secondary areas. There will be a closed-book exam in each field. (Primary area closed book format will require that the student write a three-hour exam on campus with no sources, answering three questions from a range of questions provided by the primary area supervisor. Secondary area closed book format will require that the student write a two-hour exam on campus with no sources, answering three questions from a range of questions provided by the secondary area supervisor). Area supervisors will decide whether to emphasize historiography or teaching in setting exam questions. The supervisory committee, in consultation with
the student, sets the subjects. A level of general knowledge consistent with teaching an introductory survey course is expected for each area. The oral candidacy examination is taken no later than twenty calendar days after the last written examination. The department strongly recommends that students take their candidacy examinations within 16 months of their first date of registration. Examinations must be taken within 20 months of first registration.

Final thesis oral examinations are open.

11. Research Proposal Requirements
Each doctoral student is required to submit a Dissertation Proposal to their graduate supervisory committee no more than four weeks after the oral examinations. The proposal will be approximately 2500 words in length, with three pages for the bibliography. Within two weeks of receiving the dissertation proposal, the supervisory committee will have a meeting of up to one hour with the student to discuss it. The date for the proposal meeting will be set prior to the filing of the Notice of Candidacy. All of the members of the supervisory committee will sign off on the student’s research proposal following the meeting, should they consider the proposal satisfactory. To be considered as making satisfactory progress in the PhD program, students must have their supervisory committee sign off on their dissertation proposal. Elements of a successful proposal include the problem or question that the research seeks to answer; the historiographic significance of that problem; a hypothesis as to how the problem might be addressed; a method for exploring that hypothesis; and an inventory of the most relevant evidence for the method. The proposal should also include a bibliography of three pages listing the most relevant primary and secondary work for the thesis.

12. Special Registration Information
Students should plan their courses in consultation with their supervisors, complete the Course Registration Form supplied by the department, obtain the supervisor’s signature, and bring their course program to the Graduate Coordinator for approval before registration.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships must submit their online applications to the Department by January 15.

14. Other Information
Since resources are limited, the Department may, in any year, admit fewer applicants than those who are qualified to undertake graduate studies.

15. Faculty Members/Research Interests
The research interests of current faculty can be found at: http://hist.ucalgary.ca/graduate/areas-specialization

Interdisciplinary Graduate Program IGP

Contact Information
Location: Professional Faculties Building, Room 3168
Faculty number: 403.220.7209
Fax: 403.210.8872
E-mail address: pfisk@ucalgary.ca
Web page URL: http://www.ucalgary.ca/igp

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based
Master of Science (MSc), thesis-based

All degrees are research and thesis-based and can be completed on a full-time or part-time basis.

The program emphasizes interdisciplinary research in areas not offered by other programs.

For over four decades, it has provided an intellectually enriching vehicle for many students and faculty members to pursue their research interests where these cross the limits of other program structures. It is particularly well suited to self-motivated learners and mature, independent researchers who have a strong sense of the academic path they wish to pursue.

Students may approach potential supervisors directly or, in the case of applicants from off-campus, the Director will attempt to identify potential supervisors if the applicant has submitted a research proposal well in advance of the applicable application deadline.

2. Admission Requirements
In addition to Faculty of Graduate Studies requirements, the Program requires:

a) For applicants required to prove proficiency in English a TOEFL score of 600 (paper-based test) including at least 5.0 on the Test of Written English (TWE), and a score of at least 50 on the Test of Spoken English (TSE); or 100 (internet-based test); or an IELTS score of 7.5; or a MELAB score of 84; or a PTE score of 70.

b) Three reference letters.

Master of Arts and Master of Science
a) A thesis proposal (approximately 3,500 words plus preliminary bibliography).

b) A statement explaining the interdisciplinary nature of the program of study. This shall include the three academic areas being combined for interdisciplinary study and the list of proposed courses. It shall show the relationship among the proposed courses, supervisory committee members, and areas of study (matrix format is recommended).

c) A recommendation for a supervisory committee of three people from different academic areas relevant to the research work (see section 9).

Doctor of Philosophy
a) Normally, a grade point average of 3.50 or higher on a four-point scale over a Master’s program.

b) A thesis proposal (approximately 3,500 words plus preliminary bibliography).

c) A statement explaining the interdisciplinary nature of the program of study. This shall include the three academic areas being combined for interdisciplinary study and the list of proposed courses. It shall show the relationship among the proposed courses, supervisory committee members, and areas of study (matrix format is recommended).

d) A recommendation for a supervisory committee of four people from at least three different academic areas relevant to the research work (see section 9).

e) A four-year funding proposal.

3. Application Deadline
Deadlines for submission of complete applications for Canadians and Permanent Residents:
February 1 for September admission
August 1 for January admission

Deadlines for the submission of complete applications for students that require a study permit to enter the program:
February 1 for September admission
April 1 for January admission

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission. Advanced credit requests may not exceed one-third of the course load identified at the Admission Seminar.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies requirements, the Program normally requires:

Master of Arts and Master of Science
A minimum of four graded half courses, as determined by the supervisory committee. It is expected that at least half of the courses in a student’s program will be at the graduate level.

Doctor of Philosophy
A minimum of three graded graduate-level half courses, as determined by the supervisory committee.

Specializations are determined by the supervisory committee in consultation with the Director.

Fieldwork and research done off-campus may be counted toward fulfillment of the full-time study and research requirement.

6. Additional Requirements
After an applicant’s file is complete (including thesis proposal and proposed supervisory committee), the file is reviewed by the Director. If approved by the Director, the
student, proposed supervisory committee members, and Director attend an admissions seminar. If the result is a favourable recommendation, the Director will forward the file to Graduate Studies with a recommendation for admission and approval of the supervisory committee. Applicants are admitted to undertake the specific program approved at the admissions seminar.

In the event that an applicant cannot attend the admission seminar, special arrangements for applicant participation will be made.

7. Credit for Undergraduate Courses

None.

8. Time Limit

Maximum completion time is four years for a Master’s program and six years for a doctoral program.

9. Supervisory Assignments

Students must identify a supervisor and supervisory committee in conjunction with completion of the thesis proposal. Supervisory committees for Master’s students normally consist of three people (supervisor plus two additional members). Supervisory committees for doctoral students normally consist of four members (supervisor plus three additional members). At least three different academic areas should be represented on the supervisory committee. Identification of the proposed Supervisory Committee must also include confirmation of the supervisory committee members’ willingness to assume this role after review of the research proposal.

10. Required Examinations

Doctoral candidacy examinations have a written and an oral component. The written candidacy examination normally consists of a set of three questions established by the supervisory committee. The student has three weeks to complete the written candidacy papers. The student will defend the written candidacy papers during an oral candidacy examination within one month of their submission. Although the written paper forms the basis of the oral candidacy examination, questions may extend beyond the written papers to areas as outlined in the notice of candidacy examination. Final thesis oral examinations will be open.

11. Research Proposal Requirements

A fully developed thesis proposal is required for admission. However, the thesis proposal may be modified in consultation with the supervisory committee.

12. Special Registration Information

IGP students register using the Student Centre accessible through the Portal at https://my.ucalgary.ca; however, course registration must be completed manually by completion of the Faculty of Graduate Studies Change of Registration form.

13. Financial Assistance

Limited financial assistance may be available to qualified full-time students. Applicants and program students are strongly encouraged to apply for internal and external awards. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Graduate Teaching Assistantships may also be available to doctoral students. Students applying for scholarships must submit their applications to the Program by January 15.

14. Other Information

Enquiries concerning the program should be addressed to the Program Administrator, Interdisciplinary Graduate Program, University of Calgary, Professional Faculties Building, Room 3168, Calgary, Alberta T2N 1N4.

Kinesiology KNES

Contact Information

Location: Kinesiology B, Room 146
Faculty number: 403.220.5183
Fax: 403.220.0105
E-mail address: knesgrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/knes/grad

1. Degrees and Specializations Offered

Doctor of Philosophy

Master of Science

The Doctor of Philosophy (PhD) and Master of Science (MSc) degree programs are full-time thesis-based degree programs that may be taken specializations according with Members’ research interests as below:

Adapted Physical Activity & Gerontology

Biomechanics

Exercise & Health Physiology

Health & Exercise Psychology

Multi-Media Applications in Learning

Neuro-Motor Psychology & Motor Learning

Nutrition, Metabolism & Genetics

Sport History

Sport Psychology

Sport Medicine

Master of Kinesiology

The Master of Kinesiology (MKin) is a full-time course-based program specializing in Applied Exercise Physiology. Students are normally registered as full-time students however in very exceptional circumstances, registration as part-time students may be recommended by the Faculty of Kinesiology, Associate Dean (Graduate) for subsequent approval by the Dean, Faculty of Graduate Studies or designate.

2. Admission Requirements

In addition to Faculty of Graduate Studies requirements, the Faculty of Kinesiology requires the following:

Doctor of Philosophy

a) Consent for supervision from an approved Faculty Member in Kinesiology.
b) An appropriate academic background for the area of specialization.
c) A minimum grade point average (GPA) of 3.20 or higher on a four-point scale over approximately the last two years of study.
d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written), or 92 (Internet-based), or an IELTs score of 7.5, or a MELAB score of 82.
e) Two reference letters.

Master of Science

a) Consent for supervision from an approved Faculty Member in Kinesiology.
b) An appropriate academic background for the area of specialization.
c) A minimum GPA of 3.20 or higher on a four-point scale over approximately the last two years of study.
d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written) or 92 (Internet-based), or an IELTs score of 7.5, or a MELAB score of 82.
e) Two reference letters.

Master of Kinesiology

The following are the minimum requirements for applying to the program. Please note, normally applicants with higher GPAs are selected for admission to the program.

a) A minimum grade of "B" or 3.00 in each of the following undergraduate prerequisite courses or equivalents: Anatomy, Exercise Physiology, Biomechanics, Sport Psychology and Statistics.

b) A minimum admission GPA of 3.00 or higher on a four-point scale over approximately the last two years of study in Kinesiology or an appropriate academic background for the area of specialization.

c) A demonstrated ability to be self-motivated and capable of independent study as shown in undergraduate studies, volunteer work and/or work experience in exercise science areas will be considered.

d) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written) or 92 (Internet-based), or an IELTs score of 7.5, or a MELAB score of 82.
e) Two reference letters.

3. Application Deadline

Doctor of Philosophy

Master of Science

The deadline for the submission of complete applications to thesis-based programs is March 31 for September 1 admission.
Master of Kinesiology
The deadline for the submission of complete applications to the course-based program is March 1 for September 1 admission.

4. Advanced Credit
Advanced credit will be limited to two full-course equivalents with a grade of "B" or higher for students admitted to the Master of Kinesiology program. The student must request advanced credit in writing at the time of application for admission to the Faculty of Kinesiology.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies requirements, the Faculty of Kinesiology requires:
Doctor of Philosophy
A minimum of three graduate-level half courses selected according to the student's background research focus and will be approved by the graduate supervisor and supervisory committee.
Master of Science
a) One graduate-level half course in statistics.
b) One-graduate-level half course in research design.
Master of Kinesiology
a) A total of 5.5 graduate-level full-course equivalents.
Core Courses (Required of all students): Kinesiology 606, 615, 617, 637, 673, 690, 715, 773, 775 and 785.
b) A final oral presentation is considered the capstone event. This will be undertaken in conjunction with Kinesiology 715.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Graduate credit may be granted for courses offered at the 500 level at the discretion of the Associate Dean (Graduate).

8. Time Limit
Doctor of Philosophy
Expected completion time is four years. Maximum completion time is six years.
Master of Science
Expected completion time is two years. Maximum completion time is four years.
Master of Kinesiology
Expected completion time is 16 consecutive months commencing in September. Maximum completion time is six years.

9. Supervisory Assignments
Doctor of Philosophy
Master of Science
Supervisor(s) must be identified at the time of admission for thesis-based programs. Within three months of admission, the student and supervisor(s) must select a supervisory committee according to the Faculty of Graduate Studies' procedures. The composition of the supervisory committee must be approved by the Associate Dean (Graduate).

Master of Kinesiology
Not applicable.

10. Required Examinations
Doctor of Philosophy
a) Doctoral Candidacy Examination will occur after a student's research proposal is approved by the Supervisory Committee and Associate Dean (Graduate). The Candidacy Examination has both written and oral components. The student and supervisor select one of the two formats for the written portion of the examination:
(i) A closed book, six-hour examination administered on one-day in two three-hour blocks will be invigilated by the supervisor. The supervisor will provide the student with five questions determined by the Candidacy Examination Committee. The student will answer four out of five questions. The written answers are circulated to the Candidacy Examination Committee immediately after the written examination concludes.
(ii) The Candidacy Examination Committee will determine five questions to be distributed to the student four weeks before the Oral Candidacy Examination. The student will prepare a written paper for four of the questions and submit a copy of each paper to each examiner one week before the Oral Candidacy Examination. Each paper should be a maximum of twenty double-spaced pages.
Oral Candidacy Examination: The basis of the Oral Candidacy Examination will be the written examination, general knowledge and the thesis topic. The Oral Candidacy Examination will occur seven (7) days after the written component concludes. Both the written and oral components of the Candidacy Examination must be found acceptable in order to receive a Pass.
b) Doctoral Thesis Oral Examinations are administered according to the Faculty of Graduate Studies’ procedures and are open examinations.
Master of Science
Master's Thesis Oral Examinations are administered according to the Faculty of Graduate Studies’ procedures and are open examinations.
Master of Kinesiology
Not applicable.

11. Research Proposal Requirements
Doctor of Philosophy
Master of Science
Each thesis-based student drafts and presents a research proposal to his/her supervisory committee prior to commencing data collection.
The proposal consists of:
a) Background information from the scientific literature, including a critical evaluation of previous work;
b) A clear statement of the objectives of the proposed research program;
c) An analysis of the methodology to be used in the implementation of the proposal;
d) An indication of the contributions to scientific knowledge that should result from the candidate’s research.
The supervisory committee may limit the length of the proposal, and must officially approve it before it is submitted to the Faculty of Kinesiology, Associate Dean (Graduate).

Master of Kinesiology
Not applicable.

12. Special Registration Information
None.

13. Financial Assistance
Doctor of Philosophy
Evidence of external financial support in accordance with the Faculty of Kinesiology Graduate Program requirements must be provided before admission. This external funding must be in the form of a Supervisor's Grant, external award(s), government funding, etc.
Master of Science
Students are encouraged to apply for external awards, government funding, etc. Financial assistance may be available to qualified thesis-based students in the form of Graduate Assistantships (Teaching). For information on other awards, please contact the Faculty of Kinesiology Graduate Program.

14. Other Information
Initial enquiries should be directed to Faculty of Kinesiology Graduate Program.

15. Faculty Members/Research Interests
Current faculty and their areas of research interest can be found at http://wcm2.ucalgary.ca/kines/facultycontact.

Law LAW
Contact Information
Location: Murray Fraser Hall
Faculty number: 403.220.8154
Fax: 403.210.9662
E-mail address: law@ucalgary.ca
Web page URL: http://www.law.ucalgary.ca

1. Degrees and Specializations Offered
The Faculty of Law offers thesis-based and course-based Master of Laws (LLM) programs exclusively in the Faculty’s areas of specialization: natural resources, energy and environmental law. The Faculty also offers
a Post-baccalaureate Certificate in Natural Resources, Energy and Environmental Law. Applicants interested in a Doctoral degree in Law on a Special Case basis should contact the Faculty of Law. Currently, only students with degrees from the University of Calgary, Faculty of Law will be considered.

2. Admission Requirements
In addition to the requirements of the Faculty of Graduate Studies, the Faculty of Law requires, for both the thesis-based and course-based LLM degree programs and the Post-baccalaureate Certificate program:

a) A first academic degree in law.

b) For applicants required to provide proof of proficiency in English, a minimum TOEFL Internet-based score of 100, of which the reading, listening and writing component must total 75; or a minimum TOEFL Paper-based score of 600 and a TWE score of 5.5; or the minimum IELTS overall band score of 7.0; or a MELAB score of 85; or a PTE score of 70; or for LLM applicants, successful completion of a University of Calgary Faculty of Law Post baccalaureate Certificate.

c) Applicants to the LLM program must submit a brief statement of their proposed thesis or major paper and indicate their proposed supervisor. Forms and details are available from the Faculty.

d) Two reference letters.

3. Application Deadline
a) Thesis-based LLM applications are accepted for September admission only. The deadline for submission of completed applications is December 15.

b) Course-based LLM and Post Baccalaureate Certificate applications are accepted for September or January admission. The deadline for completed applications for September admission is December 15 and the deadline for completed applications for January admission is July 15.

c) Deadlines are firm for international students, but may be flexible for Canadian students.

d) Normally students with international JD degrees will be considered for September admission only.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for courses taken as part of another completed degree/diploma/certificate or for courses taken to bring the grade point average to a required level for admission. Credit may be given for courses taken towards the Faculty of Law's thesis-based or course-based LLM degree program or as part of the Faculty's Post-baccalaureate Certificate program when transferring between programs.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies requirements, the Faculty of Law requires:

LLM (thesis-based)

a) Law 703: Graduate Seminar in Legal Research and Methodology. Students must receive a passing grade in this course to advance in the program.

b) Law 705: Graduate Seminar in Legal Theory.

c) At least two additional 600-level half courses in the areas of natural resources, energy or environmental law or in a related area or from a related discipline with the approval of the Graduate Director.

d) A substantial research thesis in the area of natural resources, energy or environmental law, approximately 100 to 125 pages (30,000-38,000 words) in length, exclusive of the bibliography, prepared under the supervision of a faculty member or other suitable person appointed by the Graduate Director.

e) Two terms in residence, normally consecutive and normally from September to April. Students need at least 15 to 18 months from initial registration for thesis completion and defence.

LLM (course-based)

a) Law 703: Graduate Seminar in Legal Research and Methodology. Students must receive a passing grade in this course to advance in the program.

b) An additional five half courses in the areas of natural resources, energy or environmental law or in a related area or from a related discipline with the approval of the Graduate Director. At least two of the five additional courses must be at the 600 level and at least two of them must have research paper evaluations. One of the additional courses may be Law 705, the Graduate Seminar in Legal Theory.

c) A major research paper, approximately 50 to 60 pages (15,000–18,000 words) in length, prepared under the supervision of a Faculty member or other suitable person appointed by the Graduate Director and evaluated on a Pass/Fail basis.

Post-baccalaureate Certificate Program

The completion of four courses in the area of natural resources, energy or environmental law or a related area, including at least one with a research paper evaluation and including at least two at the 600 level. All courses require the approval of the Graduate Director. This program is still pending approval.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Not applicable.

8. Time Limit
a) All requirements for the thesis-based LLM degree must be completed within three calendar years of initial registration.

b) All requirements for the course-based LLM degree must be completed within five years of initial registration. It is expected that full-time students will complete the program in one calendar year.

c) All requirements for the Post Baccalaureate Certificate program must be completed within three calendar years of initial registration.

d) All requirements for the Special Case PhD must be completed within six calendar years.

9. Supervisory Assignments
Contact the Faculty of Law Graduate Director for information.

10. Required Examinations
Thesis oral examinations are open.

11. Research Proposal Requirements
The proposal submitted at the time of application must be in the area of natural resources, energy or environmental law.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students, although funding for course-based LLM and Post Baccalaureate Certificate students will very rarely be provided. For information on awards, see the Awards and Financial Assistance section of this calendar or the Faculty of Law Calendar or website.

Students applying for scholarships must submit their scholarship applications to the Faculty of Law by the deadlines for completed admission applications.

14. Other Information
Attaining an LLM degree without a Canadian JD degree will not qualify graduates to practice law in Canada. Inquiries on this issue must be addressed to the appropriate provincial governing body for the legal profession. In Alberta, contact the Law Society of Alberta.

15. Faculty Members/Research Interests
The active research interests of members of the Faculty of Law and the affiliated Canadian Institute of Resources Law (CIRL) can be found on the Faculty of Law website at http://www.law.ucalgary.ca.

Linguistics LING

Contact Information
Location: Social Sciences Building, Room 820
Faculty number: 403.220.5469
Fax: 403.282.3880
E-mail address: linggrad@ucalgary.ca
Web page URL: http://ling.ucalgary.ca/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA)

The norm is full-time study, but part-time study may also be arranged. Full-time study is defined as in the Graduate Calendar (“Stu-
Program Descriptions

1. Program Descriptions

2. Admission Requirements

In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

**Master of Arts**

a) Significant undergraduate training in linguistics, normally including at least one course in syntax and one course in phonology;

b) A statement of purpose specifying the applicant’s research interests and reasons for wishing to pursue a Master of Arts degree at the University of Calgary;

c) A sample of previous work in linguistics or a related field (e.g., an Honours undergraduate thesis, or a course paper);

d) For applicants required to provide proof of proficiency in English, a minimum IELTS score of 7.0; OR a minimum TOEFL score of 560 (written test), 83 (Internet-based test); OR a minimum score of 550 (written test), 80 (Internet-based test) AND a minimum score of 5.0 on the Test of Written English (TWE); OR a MELAB score of 81; OR a PTE score of 59;

e) Three reference letters.

**Doctor of Philosophy**

a) A Master’s degree in linguistics, or a Master’s degree in a related field with significant training in linguistics at the graduate level, normally including at least one graduate course in syntax and one graduate course in phonology, with a minimum grade point average of 3.40 on a four-point scale;

b) A statement of purpose specifying the applicant’s research interests and reasons for wishing to pursue a doctoral degree at the University of Calgary;

c) A sample of previous work in linguistics or a related field (e.g., a seminar paper or Master of Arts thesis);

d) For applicants required to provide proof of proficiency in English, a minimum IELTS score of 7.0; OR a minimum TOEFL score of 560 (written test), 83 (Internet-based test); OR a minimum score of 550 (written test), 80 (Internet-based test) AND a minimum score of 5.0 on the Test of Written English (TWE); OR a MELAB score of 81; OR a PTE score of 59;

e) Three reference letters.

3. Application Deadline

Students applying for admission and university scholarships must submit their applications to the department by January 15. All applications submitted by this deadline will also receive full consideration for department scholarships and assistantships. Applications received by January 15 will normally be considered for September admission. Financial support may be limited for applications received after January 15. We strongly encourage individuals to apply as soon as possible.

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements

In addition to the Faculties of Graduate Studies and Arts requirements, the Department requires:

**Master of Arts**

a) A departmental presentation relating to the student’s thesis research. Continuation in program is dependent upon this presentation being judged acceptable by the faculty members of the Linguistics Department;

b) A minimum of six half-course equivalents, including Linguistics 611, 613 and 697;

c) Linguistics 600;

d) A demonstrated knowledge of a language other than English. This requirement can be met in the following ways:

- having received credit for one full-course equivalent in a language other than English at the undergraduate level
- Note: This may include field methods courses and/or courses on the structure of the language offered in the Department of Linguistics.

- demonstrating a native or near native ability in a language other than English
- demonstrating a strong reading knowledge of a language other than English

**Doctor of Philosophy**

a) Completion of six half-course equivalents in Linguistics beyond the MA, including Linguistics 711 and 713. Course requirements are normally completed during the first two years;

- Note: No more than two half courses can be taken with the same instructor.

b) Linguistics 600 and 797;

c) Either a knowledge of two languages other than English, or one language other than English and one research tool. This requirement can be met by fulfilling two of the following three possibilities, subject to approval by the supervisor:

i. A reading knowledge of a commonly used world language. Acceptable languages for the reading language requirement are those in which a significant body of writing pertaining to theoretical linguistics exists. Such languages include, but are not limited to, French, German, Russian, Chinese, and Japanese. This requirement can be met in the following ways: *

- successful completion of at least one full-course equivalent at the senior level in the language;
- satisfactory performance in an examination given within this Department or evidence of past schooling in which this was the language of instruction.

ii. A working knowledge of a second language. Acceptable languages for the working knowledge requirement include all non-Indo-European languages and all lesser studied Indo-European languages. This requirement can be met in the following ways: *

- successful completion of a graduate level course on the structure of the language;
- successful completion of at least one full-course equivalent at the senior level in the language;
- a demonstrated ability to conduct field work with bilingual speakers of the language;
- satisfactory performance in an examination given within this Department;
- evidence of past schooling in which a less-commonly used language was the language of instruction.

iii. A working knowledge of statistics and experimental design. This requirement can be met by passing one graduate-level half course pre-approved by the department (for example, Psychology 615 or 617).*

*It is the responsibility of the student to supply evidence that course work in a language and/or in statistics and experimental design at another university meets these requirements.

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

At both the Master’s and the doctoral level, with the approval of the Graduate Coordinator and the Department Head, a student may take a maximum of two undergraduate half-course equivalents for credit. Normally, only 500-level courses are approved as acceptable, and students must provide evidence that such courses represent a necessary contribution to their program.

8. Time Limit

Expected completion time is two years for a Master’s degree and four years for a doctoral degree. Maximum completion time is four years for a Master’s degree and six years for a doctoral degree.

9. Supervisory Assignments

**Master of Arts**

A student is assigned an interim advisor (in most cases the Departmental Graduate Director) when first registering in the program. Students must choose a thesis supervisor by the end of the second term of study (usually April). Selection of a supervisor should be by mutual agreement between the student and the faculty member concerned, in consultation with the Graduate Director. It is normal practice for the student to approach an appropriate faculty member about thesis or program supervision, rather than vice versa. In cases where the student is unsure of how to select a supervisor, the help of the Graduate Director, the Department Head, or another professor should be sought.

**Doctor of Philosophy**

Selection of a supervisor should be by mutual agreement between the student and the
faculty member concerned, in consultation with the Graduate Director. Students are strongly advised to finalize their choice by the end of the second term of study, and must do so no later than the second annual registration. It is normal practice for the student to approach an appropriate faculty member about dissertation or program supervision, rather than vice versa. In cases where the student is unsure of how to select a supervisor, the help of the Graduate Director, the Department Head, or another professor should be sought. The supervisory committee should be constituted in consultation with the student and will normally consist of the supervisor and two members recommended by the Department Head, and approved by the Graduate Director. One of the two members of this committee may be external to the department. It is desirable to have at least one committee member with supervisory experience at the doctoral level. The supervisory committee must be submitted to the Faculty of Graduate Studies no later than three months after the appointment of the supervisor.

10. Required Examinations

Doctor of Philosophy

A doctoral student is required to take the Candidacy Examination after completion of all course work, normally within 20 months of their entry into the program. Doctoral candidacy examinations have a written and an oral component. The written candidacy examination consists of an original research paper in the student’s research area, and the student’s portfolio which consists of final papers from 3 of the 6 required courses (papers are chosen by the student in consultation with supervisor), their current CV, and presentations and publications (if any). The oral examination questions will be based on the original research paper and the student’s portfolio papers.

11. Research Proposal Requirements

Master of Arts

Students in the Master’s program must complete Linguistics 697.

Doctor of Philosophy

Students in the doctoral program must submit a written thesis proposal to their supervisory committee within twenty-eight months of the first registration, but not before the student has passed his/her oral candidacy examination. The body of the proposal (excluding bibliographic references) must not exceed ten pages in length.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance is normally available to qualified students. Funding is provided to full-time students only. Students are required to inform the department of any part-time employment. Failure to do so will result in revocation of departmental funding.

For information on awards, see the Awards and Financial Assistance section of this calendar. Students applying for scholarships must submit their applications to the Department by January 15. Students whose applications are complete by January 15 will automatically be considered by the Department for Graduate Research Scholarships and Graduate Assistantship support. In addition, faculty members of this Department may have special project funds for research assistantships. Information on departmental assistantships is available on the Department’s Graduate Programs web page: http://ling.ucalgary.ca/graduate.

14. Other Information

Students should consult the Departmental Graduate Handbook for further information and regulations governing the graduate program. Copies are available from the Graduate Program Administrator, SS 756; or may be downloaded from the Department’s graduate program web page: http://ling.ucalgary.ca/graduate.

15. Faculty Members/Research Interests

Current faculty research interests can be found at http://ling.ucalgary.ca/graduate.

Mathematics and Statistics MTST

Contact Information
Location: Math Sciences Building, Room 462
Faculty number: 403.220.6299
Fax: 403.282.5150
E-mail address: gradapps@math.ucalgary.ca
Web page URL: http://math.ucalgary.ca/gradstudies

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Science (MSc), course-based and thesis-based
Divisions: Applied Mathematics, Pure Mathematics and Statistics

2. Admission Requirements

In addition to Faculties of Graduate Studies and Science requirements, the Department normally requires that:

Master of Science (thesis-based)

All students in Applied Mathematics, Pure Mathematics and Statistics take course work to the equivalent of an Honours Bachelor’s degree plus at least five half-course equivalents, or four half-course equivalents if completing program in one year (not counting the seminar course 621) at the graduate level. In addition:

a) Applied Mathematics students must include two of Applied Mathematics 605, 617, Pure Mathematics 607, 611 in their program; and, in each of the first two years of their program, the seminar course Applied Mathematics 621.

b) Pure Mathematics students must include two of Applied Mathematics 605, 617, Pure Mathematics 607, 611 in their program; and, in each of the first two years of their program, the seminar course Pure Mathematics 621.

c) Statistics students must include any three of Statistics 701, 703, 721, 723 in their program; and, in each of the first two years of their program, the seminar course Statistics 621.

Master of Science (course-based)

This degree can be completed on a full-time or part-time basis. In addition to the Faculty of Graduate Studies requirement...
Program Descriptions

that full-time students must be registered in six or more half courses per annual registration the normal course load for a full-time course-based Master of Science student is three half courses per term.

a) Applied Mathematics students take ten half-course equivalents which must include two of Applied Mathematics 605, 617, Pure Mathematics 607, 611; and, in each of the first two years of their program, the seminar course Applied Mathematics 621.

b) Pure Mathematics students take ten half-course equivalents which must include two of Applied Mathematics 605, 617, Pure Mathematics 607, 611; and, in each of the first two years of their program, the seminar course Pure Mathematics 621.

c) Statistics students take eight half-course equivalents which must include any three of Statistics 701, 703, 721, 723; and, in each of the first two years of their program, the seminar course Statistics 621.

All students complete a project resulting in a written report, followed up by an oral examination on the report.

Doctor of Philosophy
Course requirements for the Doctor of Philosophy beyond those for a Master’s degree are determined on an individual basis, but the following rules apply:

a) Applied Mathematics students must include eight half-course equivalents in their total graduate program (MSc and PhD) including the equivalent of two of Applied Mathematics 605, 617, Pure Mathematics 607, 611; and, in each of the first three years of their program, the seminar course Applied Mathematics 621.

b) Pure Mathematics students must include eight half-course equivalents in their total graduate program (MSc and PhD); including the equivalent of two of Applied Mathematics 605, 617, Pure Mathematics 607, 611; and, in each of the first three years of their program, the seminar course Pure Mathematics 621.

c) Statistics students must include eight half-course equivalents in their total graduate program (MSc and PhD); including the equivalent of Statistics 701, 703, 721, and 723; and, in each of the first three years of their program, the seminar course Statistics 621.

6. Additional Requirements
All MSc graduate students are required to register in one of the Seminar courses Applied Mathematics 621, Pure Mathematics 621, or Statistics 621 in each of the first two years of their programs.

All PhD students are required to register in one of the Seminar courses Applied Mathematics 621, Pure Mathematics 621, or Statistics 621 in each of the first three years of their program.

The Seminar courses are not counted in the calculation of the number of required half courses in each program.

7. Credit for Undergraduate Courses
Credit may be given for courses taken below the 600-level. At least one half of a graduate student’s course work must be at the 600 level or higher and only where appropriate to a student’s program may credit be given for courses numbered 500–599.

8. Time Limit
Expected completion time for full-time Master’s students is two years. The maximum completion time allowed for a thesis-based Master’s program is four years, and for a course-based Master’s program is six years. The expected completion time for a doctoral student is four years, and the maximum completion time is six years.

9. Supervisory Assignments
The Director of Graduate Studies, Department of Mathematics and Statistics assigns supervisors based upon the graduate student’s proposed program.

10. Required Examinations
Course-based Master’s students must pass an oral examination on the written report and within three months of the completion of all course-based requirements.

Doctoral students must pass written Preliminary Examinations during first year but no later than sixteen months from the beginning of their doctoral programs and before the oral candidacy examination.

Final thesis oral examinations are open.

Further details about the written and oral examinations may be obtained from the Department: http://math.ucalgary.ca/gradstudies/programs.

11. Research Proposal Requirements
At least three months before a PhD Oral Candidacy Examination, a research proposal (prepared by student and supervisor) will be submitted to the student’s Supervisory Committee. The Committee will inform the student of the material (topics, books, articles, etc) to be mastered for the Oral Candidacy Examination. The material will be based upon the proposal, and will be agreed upon with the student.

12. Special Registration Information
None.

13. Financial Assistance
Details for financial assistance can be obtained from the Department website: http://math.ucalgary.ca/student-finances.

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Department by January 15.

14. Other Information
None.

15. Faculty Members/Research Interests
Information about current faculty and their research interests is available from the Department website: http://math.ucalgary.ca/gradstudies/research.

Medicine Programs

Contact Information
Contact Info
Graduate Medical Education Office
Location: HSC G329
Fax: 403.210.8109
Web page URL: http://medicine.ucalgary.ca/grad

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD), thesis-based
Master of Science (MSc), thesis-based
Master of Biomedical Technology (MBT), course-based
Master of Community Medicine (MCM), course-based
Master of Disability and Community Studies (MDCS), course-based

Joint programs, offered with other Faculties:
The Faculty of Medicine and the Haskayne School of Business offer a combined Master of Biomedical Technology/Master of Business Administration (MBT/MBA) program. Contact either program for further information.

Students in the Faculty of Medicine and the Departments of Anthropology and Archeology may choose an interdisciplinary specialization in Biological Anthropology. For further information on the Biological Anthropology (Interdisciplinary) specialization, see the separate listing in this calendar.

The University of Calgary and Alberta offer a joint Biomedical Engineering Program. Further information can be obtained from the separate listing in this Calendar.

In addition, the University of Calgary offers the joint Leaders in Medicine Program leading to MD/Masters or MD/Doctoral degrees. Students applying to the MD/MSc or MD/PhD program must apply individually to each program and complete a supplementary application for the Leaders in Medicine Program.

Further information regarding the Leaders in Medicine Program is provided under the Degree Regulations Summary section in this Calendar.

2. Admission Requirements
In addition to the Faculty of Graduate Studies regulations, the Faculty of Medicine graduate programs require a minimum admission grade point average of 3.20 (on a four-point system; approximately equivalent to a “B+”) on the work of the last two undergraduate years for thesis-based programs.
The minimum GPA requirement for course-based programs in Medicine is 3.00 Master's Programs

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)

Master of Science (MSc), thesis-based

Faculty members in the Department are affiliated with one or more of the Faculty of Medicine's Institutes and Centres. In addition, faculty research is grouped according to research streams: Molecular and Developmental Genetics, Molecular Biology of Disease, Genomics, Proteomics and Bioinformatics and Cell Signalling and Structure. All students will have the specialization “Biochemistry and Molecular Biology.”

All Master's Thesis and Doctoral students are considered full-time. In exceptional circumstances part-time status may be considered and must be approved by the Graduate Director.

2. Admission Requirements

In addition to Faculties of Graduate Studies and Medicine requirements, the Department requires:

a) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 600 (written), or 100 (internet-based), or an IELTS score of 7.50, or a MELAB score of 84, or a PTE score of 70;

b) International applicants are required to submit scores from the Graduate Record Examination (GRE). A competitive GRE score has usually been in the 90th percentile;

c) Master’s applicants are required to submit two reference letters PhD applicants are required to submit three reference letters.

3. Application Deadline

Deadlines for submission of complete applications for students with international transcripts:

April 15 for September admission

August 15 for January admission

December 15 for May admission

February 15 for July admission

Deadlines for submission of complete applications for students with Canadian or U.S. transcripts:

June 15 for September admission

October 15 for January admission

February 15 for May admission

April 15 for July admission
Students applying to the MD/Master’s or MD/PhD program must also apply to the Leaders in Medicine program by completing a supplementary application.

4. Advanced Credit
Any credit to be given for courses completed will be included in the letter of offer for admission to the Faculty of Graduate Studies.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Medicine requirements, an interim supervisory committee will determine the courses required for each student, based on the student’s previous academic background and proposed area of research. In general, Master’s students will be required to take at least two graduate level half courses and doctoral students will be required to take at least three graduate level half courses.

6. Additional Requirements
Each student is required to participate regularly in journal club and work-in-progress seminar programs administered by the Research Group to which the student and his/her supervisor belong, and the student will present at least one journal club seminar and one work-in-progress presentation per year.

Attendance at a Research Integrity Day workshop is required for all graduate students. Consult the program website for details.

7. Credit for Undergraduate Courses
Courses at the 500 level are not usually considered graduate courses. Students should register in 500-level courses only upon the recommendation of their supervisory committee. Credit will be given for 500-level courses appropriate to a student’s program as long as an equal or greater number of courses at the 600 level or above is included in the program.

8. Time Limit
See “Medicine Programs”.

9. Supervisory Assignments
The Biochemistry and Molecular Biology Graduate Program has an optional rotation program that may last up to six months. This allows the graduate student and the potential supervisor to learn more about each other’s research interests and available research projects. The student will spend two months in each laboratory of up to three faculty members. After the rotation program, the student will select a permanent supervisor. Alternatively, a student may begin the program with a permanent supervisor, if such arrangements have been made prior to arrival.

Supervisory committees are required for both Master’s and doctoral students in the BMB Graduate Program. A permanent supervisory committee must be in place no later than 3 months after the appointment of the supervisor.

Students in the Leaders in Medicine program must have a supervisory committee constituted according to the regulations of the graduate program. In addition, these students are monitored by a Joint Liaison Committee of the Leaders in Medicine program.

10. Required Examinations
See “Medicine Programs”.

11. Research Proposal Requirements
See “Medicine Programs” entry.

12. Special Registration Information
None.

13. Financial Assistance
All students who are accepted into the Biochemistry and Molecular Biology Graduate Program will receive a minimum stipend ($20,000 for MSc students and $22,000 for PhD students) (fourth year post-candidacy PhD students will receive $23,000/yr). Students are encouraged to apply to external agencies for financial assistance from scholarships or studentships. Some of these awards provide stipends in excess of the program minimum. Information on awards can be obtained from the office of the Biochemistry and Molecular Biology Graduate Program. Students applying for University scholarships must submit their applications to the Department by February 1.

14. Course Information
All Biochemistry and Molecular Biology graduate students are required to take either the Biochemistry and Molecular Biology core course Medical Science 721; or Advanced Genetics, Medical Science 641.01 as part of their course work requirement.

Descriptions of courses with biochemistry and molecular biology content at the University of Calgary are included under Biochemistry (BCEM), Cellular, Molecular and Microbial Biology (CMMB) and Medical Science (MDSC) listings elsewhere in the Calendar. Relevant courses for the Biochemistry and Molecular Biology graduate program include:

- 500-level Courses – Courses at the 500 level are not usually considered graduate courses. Students should register in 500-level courses only upon the recommendation of their supervisory committee.
- Graduate-level Courses
  - Medical Science 731 Protein and Metabolic Engineering
  - Medical Science 603 Biology of Laboratory Animals (Biology 603)
  - Medical Science 604 Integrative Human Physiology
  - Medical Science 605 Information Storage and Processing in Biological Systems (Computer Science 605)
  - Medical Science 609.02 Genes and Development
  - Medical Science 613.05 Regulation of Gene Expression in Bacteria

Medical Science 619.01 Cellular and Molecular Neuroscience
Medical Science 619.03 Developmental Neuroscience
Medical Science 621.01 Basic Principles of Pharmacology
Medical Science 631 Muscle Physiology
Medical Science 639.01 Principles of Immunology
Medical Science 639.02 Cellular and Molecular Immunology
Medical Science 641.01 Advanced Genetics
Medical Science 641.04 Genomics
Medical Science 643 Biostatistics I and II
Medical Science 671 Techniques in Medical Science
Medical Science 675 Bioinformatics Resources for the Biologist
Medical Science 683.01 Cancer Pathology, Epidemiology and Therapy
Medical Science 683.02 Molecular Mechanisms of Cancer
Medical Science 683.04 Cell Biology of Cancer
Medical Science 717 Functional Genomics Technologies
Medical Science 721 Biochemistry and Molecular Biology
Medical Science 751.02 Cellular and Molecular Pathogenic Mechanisms of Diabetes
Medical Science 751.09 Ion Channel Diseases

15. Other Information
For further information on graduate program application and admission, consult the department website at: http://www.ucalgary.ca/bmb/.

16. Faculty Members/Research Interests
Research interests of the Groups can be found on the department website at: http://www.ucalgary.ca/bmb/FacultyResearch.

Medicine, Biomedical Technology MDBT

Contact Information
Location: Health Sciences Centre, Room G329
Faculty number: 403.220.8306
Fax: 403.210.8109
E-mail address: mbtgrad@ucalgary.ca
Web page URL: http://www.biotech.ucalgary.ca/

1. Degrees and Specializations Offered
Master of Biomedical Technology (MBT), course-based
This interdisciplinary program combines courses in basic biomedical sciences (covering genetics, biochemistry, cell biology, physiology, immunology, microbiology, and
pharmacology) with training in business aspects such as scientific, market, patent & financial analysis.

The Master of Biomedical Technology Graduate Program and the Haskayne School of Business offer a combined MBT/MBA program. Contact the Graduate Science Education Office for further information.

2. Admission Requirements

In addition to the Faculties of Graduate Studies and Medicine requirements, the program requires:

a) Normally, a four year Bachelor of Science degree in biological sciences, or its equivalent;

b) For students required to provide proof of proficiency in English, a TOEFL score of 600 (written), or 250 (computer based), or 100 (Internet-based), or IELTS score of 7.5, or MELAB test score of 84, or a PTE score of 70;

c) Two reference letters and corresponding reference forms;

d) A current resume and a personal statement outlining career goals, and how the MBT program will help achieve them.

3. Application Deadline

Deadline for the submission of completed applications for September admission:

June 1 for Canadian citizens and permanent residents, and

April 15 for applicants attending on a study visa

4. Advanced Credit

See “Medicine Programs”. In consultation with the graduate program Graduate Program Director, advanced credit may be requested in accordance with Faculty of Graduate Studies regulations.

5. Program/Course Requirements

In addition to the Faculties of Graduate Studies and Medicine requirements, the program requires all MBT students to successfully complete eleven half-course equivalents:

1. Medical Science 672: Biotechnology Business Aspects (3 credits - runs over Fall and Winter)

2. Medical Science 673: Biomedical Technology Careers (3 credits - runs over Fall and Winter)

3-4. Medical Science 674.01: Physiological and Pharmacological Aspects of Therapeutics Development (6 credits - runs over Fall and Winter)

5-6. Medical Science 674.02: Molecular, Cellular and Immunological Biotechnology (6 credits - runs over Fall and Winter)

7. Medical Science 669: Clinical Trials and Bio-Manufacturing (3 credits - runs over Fall and Winter)

8. Medical Science 678: Project in Biomedical Technology (3 credits - runs over Fall and Winter)

9. Medical Science 668: Biotechnology Commercialization (3 credits - runs over Winter)

10-11. Medical Science 670: Practicum in Biomedical Technology (6 credits - runs over Spring and Summer)

It is expected that MBT students will successfully complete all Fall and Winter courses prior to beginning their practicum.

6. Additional Requirements

Suggested prerequisites: Genetics (Biology 311 or equivalent), Cell Biology (Biology 331 or equivalent, Biochemistry or macro molecules (Biochemistry 393 or equivalent).

7. Credit for Undergraduate Courses

None.

8. Time Limit

This program may be completed in one year on a full-time basis. It may also be completed on a part-time basis. Maximum completion time is six years.

9. Supervisory Assignments

The Graduate Program Director will serve as interim supervisor for all newly admitted students. In the MBT program, there is no official requirement for students to have a supervisor. We do recommend, however, that students have a faculty supervisor and/or a mentor from the business community. See “Medicine Programs” for more information.

10. Required Examinations

None.

11. Research Proposal Requirements

None.

12. Special Registration Information

None.

13. Financial Assistance

None.

14. Other Information

None.

15. Faculty Members/Research Interests

None.

Medical, Cardiovascular/Respiratory Sciences MDCV

Contact Information

Location: Health Sciences Centre, Room G329

Faculty number: 403.220.8306

Fax: 403.210.8109

E-mail address: cvgrad@ucalgary.ca

Web page URL: http://www.ucalgary.ca/crs_gse/

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
minimum of two half courses were completed in their MSc program.

d) Students transferring from the MSc program to the PhD program are required to complete a minimum of one additional half course.

e) Students holding a completed MSc degree in an unrelated field of studies entering the Ph.D. program are required to complete a minimum of three half courses unless otherwise agreed by the student’s supervisory committee.

f) Attendance at the seminar and journal club series organized by the student’s respective research group (Cardiovascular, Respiratory, or Smooth Muscle) and the presentation of at least one research-in-progress seminar annually. Students are also required to participate in the monthly MDCV student seminar program, which will include an annual presentation.

The amount of course work is determined by the student’s supervisory committee; however, it also must meet the departmental minimum requirements.

6. Additional Requirements

Attendance at a Research Integrity Day workshop is required for all graduate students. MSc students must attend prior to defending their thesis and PhD students must attend prior to their candidacy oral examination.

7. Credit for Undergraduate Courses

Credit may be given for courses taken below the 600 level. At least one half of a graduate student’s course work must be at the 600 level or higher. Only under unusual circumstances and upon the recommendation of the supervisory committee and approval by the Graduate Director may credit be received for courses numbered 500–599.

8. Time Limit

Expected completion time is four years for the Doctor of Philosophy program. Expected completion time is four to five years for the MD/Master’s program and six to seven years for the MD/PhD program. See “Medicine Programs” for maximum completion times.

9. Supervisory Assignments

The selection of the supervisor must be by mutual agreement between the student and the faculty member concerned and approved by the MDCV Graduate Director. The supervisor will be a member of the Cardiovascular, Respiratory or Smooth Muscle Research Groups. Every graduate student must have a supervisory committee named within eight months after initial registration. The final composition of the supervisory committee must be approved by the MDCV Graduate Director.

10. Required Examinations

See “Medicine Programs”.

11. Research Proposal Requirements

See “Medicine Programs” entry.

12. Special Registration Information

None.

13. Financial Assistance

All students who are accepted into the Cardiovascular/Respiratory Science Graduate Program will receive a minimal stipend as reflected by current CIHR/AHFMR awards. Students are encouraged to apply to external agencies for financial support and studentship awards. University of Calgary Scholarships and the Medical Science Doctoral Program Scholarship are also available (see Awards and Financial Assistance section of this Calendar). Possible sources of financial support are listed on the Faculty of Graduate Studies website:

http://grad.ucalgary.ca/awards.

Students in the program are eligible to receive a Graduate Student Support Scholarship to assist them with tuition while paying full program fees. The amount of the scholarship varies from year to year.

14. Other Information

Courses in the Department of Cardiovascular/Respiratory Sciences are offered under the auspices of the Department of Medical Science. For information on course requirements please visit the graduate program’s webpage at http://www.ucalgary.ca/crs_gse/. Detailed course descriptions are available at http://www.ucalgary.ca/pubs/calendar/ and timetabling information can be found through the MyUofC portal.

15. Faculty Members/Research Interests

Faculty members and their research interests may be found at http://www.ucalgary.ca/crs_gse/node/30.

Medicine, Community Health Sciences MDCH

Contact Information

Location: Teaching, Research and Wellness (TRW)
Faculty number: 403.220.4288/210.6689
Fax: 403.210.8109
E-mail address: chsgrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/communityhealthsciences

The Department of Community Health Sciences offers a number of degrees and specializations. Details on the course-based Master’s degrees are presented first, followed by the thesis-based degrees. Further information on degree offerings can be obtained from the Department’s website.

Course-Based Degrees

1. Degrees and Specializations Offered

a) Master of Community Medicine (MCM), a course-based degree available only to physicians registered in the Community Medicine Residency Training Program.

b) Master of Disability and Community Studies (MDCS), a course-based degree ex-

amines the intersection between community, disability, chronic illness, and marginalizing conditions within a social justice framework. The goal is to generate research, leadership, capacity, innovation, and partnerships. The graduate program attracts professionals across disciplines and sectors. The MDGS is offered in an alternate delivery format (combined face-to-face and online) and has a differential tuition fee.

Students wishing to charter a Community Medicine Residency Training Program in Community Medicine at University of Calgary

b) MDGS - August 15 for January admission

4. Advanced Credit

a) MCM - Applicable graduate courses may be considered.

b) completed at a satisfactory level (minimum “B+”) and within three years of admission to the graduate program, may be credited toward a student’s degree requirements. See “Medicine Programs”.

5. Program/Course Requirements

In addition to Faculties of Graduate Studies and Medicine requirements, the Department requires:

a) MCM - A minimum of twelve course-based equivalents, in combination with the Community Medicine Residency Program.

b) MDGS - A minimum of twelve course-based equivalents.

Course descriptions and detailed outlines of courses offered by the Department of Community Health Sciences are found on the departmental website at http://www.ucalgary.ca/communityhealthsciences/. They are also listed at the end of this Community Health Sciences Calendar entry.

6. Additional Requirements

None.
7. Credit for Undergraduate Courses
The Department does not normally give credit for undergraduate courses.

8. Time Limit
a) MCM - Expected completion time is within 6 years.
b) MDCS - Expected completion time is 3 years
See “Medicine Programs” for maximum completion times.

9. Supervisory Assignments
a) MCM - A Supervisor must be named as part of the admission process. The Supervisory Committee must be named prior to planning the Community Health Sciences 602: Practicum in Community Medicine, usually in the second term of the second year of the student’s program.
b) MDCS - A faculty member is assigned as a supervisor prior to the final project; supervisory committee is not required.

10. Required Examinations
a) MCM - A final comprehensive written and oral examination with respect to the course content, plus a practical examination.
b) MDCS - A capstone project with a public presentation and paper will be required for completion of the degree. For further details, please see the department website.

11. Research Proposal Requirements
a) MCM - A formal research proposal is not necessary, however, a practicum proposal is required.
b) MDCS - Not applicable.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, please see the Awards and Financial Assistance section of this Calendar.

14. Other Information
MDCS - Students are encouraged to produce an article for publication.

15. Faculty Members/Research Interests
Current faculty and their areas of research can be found at: http://www.ucalgary.ca/communityhealthsciences/.

Thesis-Based Degrees
1. Degrees and Specializations Offered
a) Doctor of Philosophy (PhD)
b) Master of Science (MSc)
Within the thesis-based programs, the student must select a specialization in Biostatistics, Epidemiology, Healthcare Epidemiology, Clinical Epidemiology, Health Services Research, Population/Public Health or Community Rehabilitation and Disability Studies.

Descriptions of each specialization and its requirements are found on the Departmental website at: http://www.ucalgary.ca/communityhealthsciences/.

2. Admission Requirements
In addition to Faculty requirements, the Department requires:
- A BSc, BA, BCR, MD or equivalent degree for admission to the Master of Science program
- For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 600 (written test), or 100 (Internet-based test), an IELTS score of 7.0, a MELAB score of 84, or PTE score of 70.
- A statement outlining the applicant’s interest and reasons for choosing the program.
- A letter from a faculty member of our Department indicating interest in supervising the applicant.
- Work and/or research experience in the health system, community rehabilitation and/or disability studies is highly recommended.
f) Two letters of reference

3. Application Deadline
The deadline for the submission of complete applications is January 15 for September admission.
Students applying to the MD/MSc or MD/PhD program must apply individually to each program and complete a supplementary application for the Leaders in Medicine Program.

4. Advanced Credit
Open Studies Students may take courses before applying for admission to a graduate program. However, Open Studies Students are not eligible to enrol in the three core courses, Essentials of Biostatistics (MDCH 610), Fundamentals of Epidemiology (MDCH 640), and Health Research Methods (MDCH 681). A maximum of two half courses, completed at a satisfactory level (minimum "B+") and within three years of admission to the graduate program, may be credited toward a student’s degree requirements. Completing courses does not guarantee admission into the program.

5. Program/Course Requirements
In addition to Faculty requirements, the Department requires that all students complete two Block Week courses: “Introduction to Community Health Sciences” and “Determinants of Health” and the following:

Master of Science
- A minimum of six half-course equivalents (three core courses and three electives) for all specializations. The CRDS specialization requires a minimum of six half courses from the CRDS Specialization.
- See departmental website for specific course requirements for each MSc specialization.

Doctor of Philosophy
- A minimum of four half-course equivalents, in addition to the three core courses if not completed previously. The CRDS specialization requires a minimum of four half courses from the CRDS Specialization.
- See departmental website for specific course requirements for each PhD specialization.
- Brief course descriptions follow this section. Some courses are only offered in block weeks. More detailed course schedules and outlines are found on the departmental website at: http://www.ucalgary.ca/communityhealthsciences/.

6. Additional Requirements
In addition to the Faculty requirements, the Department requires that all students attend the departmental seminars offered weekly and student seminars offered bi-weekly during the academic year.
Attendance at Research Integrity Day is required once during a student’s program. Some students may be exempt from these requirements.

7. Credit for Undergraduate Courses
The Department does not normally give credit for undergraduate courses.

8. Time Limit
Expected completion time is two to three years for the MSc program and 4-5 years for the PhD program. See “Medicine Programs” for maximum completion times.

Leaders in Medicine
- Expected completion time is four to five years for the MD/MSc program and six to seven years for the MD/PhD program. See “Medicine Programs” for maximum completion times.

9. Supervisory Assignments
Applicants must secure a supervisor prior to applying for admission. The Supervisor, in consultation with the student and the Graduate Program Director, recommends the Supervisory Committee during the second academic term of the first year of the program. The student and Supervisor complete and submit an Appointment of Supervisor/Supervisory Committee form.

Students in the Leaders in Medicine Program must also have a Supervisory Committee constituted according to the above regulations. Both Master of Science and doctoral students will also be evaluated and advised by a Joint Liaison Committee composed of the Associate Dean (Graduate Sciences Education), Associate Dean (Undergraduate Medical Education), and the Associate Dean (Research) of the Faculty of Medicine.

10. Required Examinations
In the PhD program the student and his/her Supervisory Committee establish a concept map outlining the student’s study area and an accompanying reading list to prepare for the candidacy exam. The Supervisory Committee develops three exam questions that meet the competency requirements as
Program Descriptions

outlined by the department. These ques-
tions are derived from the concept map and 
reading list developed for each student. Questions on the research proposal are 
not included. The student has three weeks 
to prepare written solutions to the three 
questions.

In both MSc and PhD programs final thesis 
oral examinations are open.

11. Research Proposal Requirements
The proposal is usually 12 to 15 single-
spaced, typed pages. Appendices are 
permitted and should include the research 
instrument and, if the research involves 
agencies or institutions outside of the 
Department, their written permission to 
conduct the research. Doctoral students 
should include a complete literature review 
as an appendix.

After approval by the student's Supervisory 
Committee and before commencement of 
data collection, all proposals are sub-
mitted to the Conjoint Health Research Ethics 
Board for ethical review, and most are 
submitted to the appropriate committee for 
impact review.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available 
to qualified students. For information on 
awards, please see the Awards and Finan-
cial Assistance section of this calendar.

The Department's deadline for applications 
to the Graduate Award Competition is Janu-
ary 15.

14. Other Information
Courses in Community Health Sciences 
(MDCH) are listed in the Courses of Instruc-
tion section.

15. Faculty Members/Research 
Interests
Current faculty and their areas of re-
search are on the departmental 
website at: http://www.ucalgary.ca/
communityhealthsciences/.

Medicine, Gastrointestinal 
Sciences MDIGI

Contact Information
Location: Health Sciences Centre, Room 
G341B
Faculty number: 403.210.9572
Fax: 403.210.8109
E-mail address: gigrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/gisgp/

1. Degrees and Specializations 
Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based 
Specializations: Physiology, Biochemistry, 
Molecular Biology, Pharmacology, Immu-
nology, Immunopharmacology, Nutrition, 
Parasitology, Pathology, Epidemiology

All Master's Thesis and Doctoral students 
are considered full-time. In exceptional 
circumstances part-time status may be 
considered and must be approved by the 
Graduate Coordinator.

2. Admission Requirements
In addition to Faculties of Graduate Studies 
and Medicine Program requirements, the 
Department requires:
a) For applicants required to provide proof 
of proficiency in English, a minimum TOEFL 
score of 600 (written test), or 100 (Internet-
based test), or an IELTS score of 7.5, or a 
MELAB score of 84 or a PTE score of 70;
b) Two reference letters.

3. Application Deadline
Students may be admitted for September, 
January, or May. Contact the department for 
general application guidelines.

Students applying to the MD/MSc or MD/
PhD program must apply individually to 
each program and complete a supplemen-
tary application for the Leaders in Medicine 
Program.

4. Advanced Credit
See "Medicine Programs".

5. Program/Course Requirements
In addition to Faculties of Graduate Studies 
and Medicine requirements, the Department 
requires:
a) The completion of a minimum of two 
half-course equivalents for the Master 
of Science. For the degree of Doctor 
of Philosophy, the completion of a minimum 
of one half-course equivalent for those 
entering with a Master's degree in a related 
subject. For those entering with a Bachelor 
of Science or equivalent, a minimum of 
three half-course equivalents are required. 
Normally, one of these courses is Medi-
cal Science 637.01. Exceptions, however, 
can be approved by the coordinator on the 
recommendation of the supervisor or the 
graduated education committee;
b) A supervisory committee;
c) A written research proposal presented 
to the supervisory committee within twelve 
months of initial registration;
d) A seminar presentation once a year. 
Exceptions require recommendation by the 
supervisory committee and approval of the 
Graduate Coordinator;
e) For doctoral students, a comprehensive 
written examination must be completed and 
submitted to the examiners one week before 
the oral candidacy examination;
f) Regular, mandatory attendance at the G.I. 
Sciences weekly seminar program.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
No credit given.

8. Time Limit
Expected completion time is two years for 
the Master's program and four years for the 
doctoral program.

Expected completion time is four to five 
years for the MD/MSc program and six to 
seven years for the MD/PhD program.

See “Medicine Programs” for maximum 
completion times.

9. Supervisory Assignments
See “Medicine Programs”.

The various laboratories in the group as-
sest students, and the laboratory that has 
a need/interest in the student will offer the 
student a placement.

10. Required Examinations
See “Medicine Programs” entry.

11. Research Proposal Requirements
See “Medicine Programs” entry.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available 
to qualified students. For information on 
awards, see the Awards and Financial As-
stance section of this Calendar.

Students applying for scholarships must 
submit their applications to the Department 
by February 1.

14. Other Information
Please visit the Department of Gastroin-
testinal Sciences Website at http://www.
ucalgary.ca/girg/ for additional information.

15. Faculty Members/Research 
Interests
Current faculty research interests and addi-
tional information of the MDIGI graduate pro-
gramme can be found at: http://wcmprod2.
ucalgary.ca/gisgp/.

Medicine, Immunology MDIM

Contact Information
Location: Health Sciences Centre, Room 
G329
Faculty number: 403.210.9572
Fax: 403.210.8109
E-mail address: imgrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/irg/

1. Degrees and Specializations 
Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based 
Area of Study: Immunology

Faculty members are affiliated with the Fac-
ulties of Medicine, Science, and Veterinary 
Medicine.

The Immunology Graduate Program is 
offered in collaboration with the above facul-
ties, and the curriculum has been designed 
for students with undergraduate or MSc 
degrees in those faculties.
Background experience, qualifications, and areas of interest of applicants will be taken into account at the time of admission. Students in the MSc and PhD degree programs are normally considered full-time.

2. Admission Requirements
In addition to the Faculties of Graduate Studies and Medicine requirements, this program requires:

- For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 600 (written), or 100 (internet-based), or a minimum IELTS score of 7.0, or a minimum MELAB score of 84, or a minimum PTE score of 70.
- Two references from individuals that can attest to the applicant’s academic background. Each referee will provide a reference form and accompanying letter on institutional letterhead.
- Endorsement by the Chairperson, Immunology Graduate Education Committee (IGEC) that the applicant is acceptable and that adequate supervision of the proposed program is available.
- An undergraduate course in immunology (Cellular, Molecular Microbial Biology 527 or equivalent). It will be possible for a student to take Medical Science 639.01 during the first year of their program if he/she does not have an appropriate prerequisite course.
- Meeting the minimum admission criteria above does not guarantee acceptance into the program. Applications will be ranked according to academic excellence, prior research experience and commitment to the study of immunology.

3. Application Deadline
Deadlines for submission of complete applications for students with international transcripts:
- April 1 for September admission
- August 1 for January admission
- December 1 for May admission

Deadlines for submission of complete applications for students with Canadian and US transcripts:
- June 1 for September admission
- October 1 for January admission
- March 1 for May admission

4. Advanced Credit
Applicants may request to receive credit for previously completed courses at the time of application. Where credit is to be given, it will be noted in the letter to the Faculty of Graduate Studies recommending the student’s admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Medicine requirements, the Immunology Graduate Program requires:

- Completion of a minimum of two half courses for an MSc and three half courses for a PhD. Medical Science 639.02 or 639.04 is compulsory for all MSc students. Both courses are compulsory for PhD students.
- Optional courses for either degree can be drawn from any 600-level courses offered by the Faculty of Medicine in areas that are relevant to the student’s research proposal, and approved by the supervisor and supervisory committee. Courses taken while a student is an Open Study student cannot be used as credits in either the MSc or PhD program.
- Participation in the seminar program of the Immunology Research Group (IRG). This will entail the annual presentation of a 30-50 minute Research in Progress seminar, attendance at the weekly seminars and journal club.
- Presentation on the thesis project to the IRG around the time of the defence.

6. Additional Requirements
Attendance at a Research Integrity Day workshop is required for all graduate students. MSc students must attend prior to defending their thesis and PhD students must attend prior to their candidacy oral examination.

7. Credit for Undergraduate Courses
Credit will not be given for courses taken below the 600-level.

8. Time Limit
Expected completion time is 2.5 years for an MSc and 5 years for a PhD. See “Medicine Programs” for maximum completion times.

9. Supervisory Assignments
Individuals intending to apply for admission to the Immunology Graduate Program are encouraged to contact faculty members directly regarding the possibility of acting as a supervisor. If a potential supervisor has not been identified at the time of application, applications that meet or exceed the minimum criteria will be circulated to potential supervisors based on the indicated areas of interest (declared by candidates in the application). A supervisor and a source of funding (minimum of $18,750 per annum) must be identified for a student to be admitted to the Immunology Graduate Program.

The supervisor, in consultation with the student, selects a Supervisory Committee. For MSc students, the Supervisory Committee consists of the supervisor plus 2 faculty members, at least one of whom must have completed the supervision of an MSc student. For PhD students, the Supervisory Committee consists of the supervisor plus a minimum of 2 faculty members. At least two members should be from the IRG, and at least two members must have completed the supervision of a doctoral graduate.

10. Required Examinations
See “Medicine Programs”.

11. Research Proposal Requirements
See “Medicine Programs” entry.

12. Special Registration Information
Exceptional students registered for the MSc degree may request to change their registration status to that of a PhD candidate within 24 months of admission to the program. Within 18 months of first registration, the student will discuss with the supervisor his/her intent to transfer from the MSc to the PhD program. Students are only eligible for transfer if at least 2 graduate courses have been completed. A revised draft research proposal should be presented to the supervisory committee before the transfer has occurred. Transfers will require unanimous approval from each member of the supervisory committee and recommendation to the Chairperson, IGEC. The student’s academic record and approval from the supervisory committee will be considered in making a decision to recommend a transfer into a PhD program. If the transfer is approved, the Chairperson, IGEC will send a written recommendation to the Dean of the Faculty of Graduate Studies.

The student will be required to submit a revised research proposal and complete the course requirements of the doctoral program. Student must meet the 30-month deadline for the candidacy oral examination.

13. Financial Assistance
Applicants must identify a source of funding to be admitted into the Immunology Program. Graduate students are generally funded by their supervisor’s operating grants, internal awards, and/or external awards. Self funding is not an option. Possible sources of financial support are listed on the Faculty of Graduate Studies awards database: http://grad.ucalgary.ca/awards. These include Graduate Assistantships (Teaching), Faculty of Graduate Studies Scholarships, Dean’s Excellence Awards, Dean’s Entrance Awards, and the Faculty of Graduate Studies Open Scholarship Competition.

Students in the program are eligible to receive a Graduate Student Support scholarship to assist them with tuition while paying full program fees, upon completion of annual program requirements. Students are also eligible to receive the Immunology Program Specific award for travel to a national or international scientific meeting to make a presentation. In addition, the Immunology Program Award for Research Excellence is awarded to students whose final thesis is deemed worthy of nomination for a national or international award by the majority of the examiners of their final thesis. In addition to a certificate, the student receives a monetary award.

14. Other Information
The Immunology Graduate Program offers the following four courses:
- Medical Science 639.01: Principles of Immunology
- Medical Science 639.02: Cellular and Molecular Immunology
Medical Science 639.03: Topics in Immunology
Medical Science 639.04: Inflammation
Information regarding the courses can be obtained at http://www.ucalgary.ca/irg/education.
Detailed course descriptions are available at http://www.ucalgary.ca/pubs/calendar and timetabling information can be found through the myUofC portal.

15. Faculty Members/Research Interests
The research interests of current IRG faculty members can be found at: http://www.ucalgary.ca/irg/faculty.

Medical, Microbiology and Infectious Diseases MDMI

Contact Information
Location: Health Sciences Centre, Room G329
Faculty number: 403.220.2558
Fax: 403.210.8109
E-mail address: midgrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/microinfect/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc) thesis-based

2. Admission Requirements
In addition to Faculties of Graduate Studies and Medicine requirements, the Department requires:
a) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test), or 92 (Internet-based test), or an IELTS score of 7.0, or a MELAB score of 82 or a PTE score of 64.
b) Two reference letters.
Applicants who do not meet the above requirements will be considered only in exceptional circumstances.

3. Application Deadline
Deadlines for the submission of complete applications:
May 15 for September admission
September 15 for January admission
January 15 for May admission
Students applying to the MD/Master’s or MD/PhD program must apply individually to each program and complete a supplementary application to the Leaders in Medicine Program.
Students with international transcripts should contact the department for application deadlines.

4. Advanced Credit
See “Medical Programs” entry.

5. Program/Course Requirements
In addition to Faculty requirements, the Department requires:

Master of Science
a) The completion of a minimum of one full-course equivalent
b) The presentation of an annual seminar in the applicable research group

Doctor of Philosophy
a) The completion of a minimum of one and one-half full-course equivalents
b) The presentation of an annual seminar in the applicable research group
c) The presentation of a seminar on the results of his/her thesis research

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
No more than half a student’s program may be done at the 500 level.

8. Time Limit
Expected completion time is two years for students in the Master of Science program and four years for doctoral students. Maximum completion time is four years for the Master of Science program and six years for the doctoral program.
Leaders in Medicine - Expected completion time for the MD/Master’s program is four to five years, and for the MD/PhD program, six to seven years. The maximum completion time is six years for the MD/Master’s, and eight years for the MD/PhD program.
See “Medical Programs” for maximum completion times.

9. Supervisory Assignments
Students may interview several potential supervisors. The decision to establish a relationship is based upon mutual agreement between the student and the supervisor. Supervisory committees are established upon the needs of the student and the expertise of the committee members, following discussions between the student and the supervisor.

10. Required Examinations
See “Medical Programs” entry.

11. Research Proposal Requirements
See “Medical Programs” entry in this Calendar.

12. Special Registration Information
None.

13. Financial Assistance
The general policy of the Microbiology and Infectious Diseases Graduate Program is that all students shall be full-time and that all students will receive financial support for the entire period of their program.

14. Other Information
Courses in Microbiology and Infectious Diseases are offered under the auspices of the Department of Medical Science and are listed in this Calendar under that heading.

15. Faculty Members/Research Interests
The research interests of the faculty can be found at http://www.ucalgary.ca/microinfect/faculty.

Medicine, Neuroscience MDNS

Contact Information
Location: Health Sciences Centre, Room G329
Faculty number: 403.220.2558
Fax: 403.210.8109
E-mail address: neurosci@ucalgary.ca
Web page URL: http://www.ucalgary.ca/neuroscience

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based

2. Admission Requirements
In addition to Faculties of Graduate Studies and Medicine requirements, the Department requires:
a) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test), or 92 (Internet-based test), or an IELTS score of 7.0, or a MELAB score of 82, or a PTE score of 64;
b) Two reference letters.

3. Application Deadline
Deadlines for submission of complete applications for students with Canadian and U.S. transcripts:
May 15 for September admission
September 15 for January admission
February 15 for May admission
April 15 for July admission
Students with international transcripts should contact department for application deadlines.

4. Advanced Credit
Not given.

5. Program/Course Requirements
In addition to the Faculties of Graduate Studies and Medicine requirements, the Department requires:

Master of Science
a) Satisfactory completion of Cellular, Molecular and Developmental Neuroscience (Medical Science 619.01), and Systems Neuroscience and Neuropathology (Medical Science 619.02);
b) Participation in a seminar program and journal club, and presentation of research seminar.

Doctor of Philosophy
a) Satisfactory completion of Cellular, Molecular and Developmental Neuroscience (Medical Science 619.01) and Systems Neuroscience and Neuropathology (Medical Science 619.02);
the scope and quality of their thesis research.

6. Additional Requirements
As determined by agreement with Supervisor and Supervisory Committee

7. Credit for Undergraduate Courses
Not given.

8. Time Limit
Expected completion time for students in a Master’s program is two years, four years for a doctoral program. See “Medicine Programs” for maximum completion times.

9. Supervisory Assignments
Supervisors must be identified and committed to support the student for the first two years, before admission is recommended. The decision should be by mutual agreement between the prospective student and the faculty member, and approved by the Graduate Coordinator. For relevant criteria and responsibilities of supervisors, see the Policies and Procedures of the Department of Neuroscience and the Handbook of Supervision and Examinations in this calendar. A Supervisory Committee must be struck within three months of initial registration. The method of striking, composition and functions of the Supervisory Committee are detailed in the Policies and Procedures.

10. Required Examinations
See “Medicine Programs” entry.

11. Research Proposal Requirements
See “Medicine Programs” entry.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance is available to qualified students through supervisor operating grants or competitive awards (a minimum stipend of $20,000 is recommended). For information on awards, see the Awards and Financial Assistance section of this Calendar, the Department of Neuroscience, the Faculty of Medicine Research Office and the education section of the Hotchkiss Brain Institute at http://www.hbi.ucalgary.ca/education.

14. Other Information
Rather than study in “classical” disciplines such as anatomy or physiology, students are placed with a supervisor who is a member of a multidisciplinary research group. This multidisciplinary scheme greatly facilitates the development of individual research programs, especially with respect to collaborations involving different techniques and model systems. Students are encouraged to take advantage of such collaborations to enhance the scope and quality of their thesis research.

The purpose of the graduate program is to educate independent, reliable, and competent research neuroscientists. Although many holders of Master of Science and Doctor of Philosophy degrees find employment that does not directly involve research, having such degrees implies that an individual is able to pursue a research problem to a meaningful conclusion. The main role of the program is to provide a favourable environment both for creative research and for the acquisition of a basic body of knowledge in the neurosciences. The Master of Science and doctoral degrees are distinguished both in the degree of originality expected in the candidate’s research, and in the normal course load undertaken. Members of the Department of Neuroscience, other than the supervisor, have an important role to play in each student’s training.

Further information on applications and admission, and brochures describing the research interests of individual Department members may be obtained from the Department Program Administrator, Neuroscience Graduate Program, Graduate Neuroscience Education, Faculty of Medicine, University of Calgary, Room G329, Health Sciences Centre, 3330 Hospital Drive NW, Calgary, Alberta T2N 4N1. Faculty research interests can also be accessed on the Department of Neuroscience website at http://www.ucalgary.ca/neuroscience or the Hotchkiss Brain Institute website at http://www.hbi.ucalgary.ca/index.php.

Courses in Neuroscience are offered under the auspices of the Department of Medical Science and are listed in this Calendar following the Medical Science heading.

15. Faculty Members/Research Interests
The research interests of the department can be found at either the Department of Neuroscience website at http://www.ucalgary.ca/neuroscience or the HBI website http://www.hbi.ucalgary.ca/Members.

Medicine, Medical Science MDSC

Contact Information
Location: Health Sciences Centre, Room G321
Faculty number: 403.220.6852
Fax: 403.210.8109
E-mail address: medgrad@ucalgary.ca
Web page URL: http://www.ucalgary.ca/mdsc

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
Students in the MSc and PhD degree programs are normally considered full-time. Students can specialize in an area covered by one of the Faculty of Medicine Research Institutes and include topics as wide-ranging as Medical Education to Physiology. Cancer Biology, Critical Care Medicine, Mountain Science and Medicine and High Altitude Physiology, Joint Injury and Arthritis, and Medical Education also have their own specializations within the Medical Science Graduate Program. A part-time option may be available within these specializations. In addition to these areas students may also specialize in Biomechanics and Biomedical Ethics. Students may select additional areas of specialization with the approval of the Graduate Program Director.

In co-operation with the Department of Surgery, a Master of Science program with a specialization in surgery is also offered through the Surgeon Scientist Program.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Medicine requirements, the Medical Science Graduate Program requires:

a) For applicants required to provide proof of proficiency in the English language, a minimum TOEFL score of 600 (paper-based test), 100 (Internet-based test), or a minimum IELTS score of 7.0, or a minimum MELAB score of 84, specializations may have additional requirements;

b) Two reference letters;

c) For admission to the Master of Science program with a specialization in surgery, prior admission to the surgery residency program is required. Students will normally apply to the Master of Science program in the third-year of the surgery residency program. For admission to the Surgeon Scientist Program prior admission to the Medical Science Graduate Program is required.

3. Application Deadline
Students may be admitted for September, January, May, or July. Contact the Medical Science Graduate Program office for general application deadlines.

4. Advanced Credit
Advanced credit is not normally given in a thesis-based program. See “Medicine Programs”.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Medicine requirements, the Department requires:

Master of Science
a) A minimum of two half courses;

b) Regular attendance and presentation at a journal club and a final seminar which precedes the thesis defence, although specific training programs may have additional requirements.

Doctor of Philosophy
a) A minimum of three half courses;

b) Regular attendance and presentation at a journal club and a final seminar which precedes the thesis defence, although specific training programs may have additional requirements.

6. Additional Requirements
Attendance at a half-day Research Integrity Day seminar during their program. Students must attend this seminar before they are approved to defend their thesis. The seminar
Program Descriptions

Military and Strategic Studies CMSS

Contact Information
Location: Library Tower, 7th floor
Faculty number: 403.220.4038
Fax: 403.282.0594
E-mail address: cmss@ucalgary.ca
Web page URL: http://www.cmss.ucalgary.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Strategic Studies (MSS), course-based (including the co-operative education option) or thesis-based

Students in the Master of Military and Strategic Studies program may choose an interdisciplinary specialization in Israel Studies. For further information on the Israel Studies (Interdisciplinary) specialization, see the separate listing in this Calendar.

2. Admission Requirements

In addition to the requirements of the Faculties of Graduate Studies and Arts, CMSS requires:

Master of Strategic Studies (MSS), course-based and thesis-based

- A Bachelor’s degree grade point average of at least 3.40 on a four-point scale
- A writing sample
- Agreement to supervise from a potential supervisor from applicants to the thesis-based program
- A research proposal from applicants to the thesis-based program

Doctor of Philosophy

Applicants will be admitted only if the CMSS Graduate Committee is satisfied that adequate supervision is likely to be available for the duration of their studies. Successful applicants should be aware that admission to the program does not imply a Centre commitment to provide supervision for all research interests they may have. Students are also advised to consult the Faculty of Graduate Studies Handbook of Supervision and Examination.

Prerequisites for admission to the PhD program are:

- A completed Master’s Degree.
- A GPA of 3.70 on a four-point scale over all completed graduate courses in the Master’s program; 3.40 in the Undergraduate program over the last 20 half courses or two years of study.
- A completed application to the Centre, along with supporting documentation.
- A detailed statement of the proposed thesis research.
- A representative piece of written work, normally a Master’s Thesis chapter or major research paper.
- The Centre requires a tentative agreement from a faculty member to supervise, so students need to contact potential supervisors at the beginning of the application process.

- All students whose native language is one other than English are required to pass the TOEFL test with a minimum score of 600 (written), or 92 (Internet-based), or 7+ on the IELTS test, or 64 on the MELAB test, or 70 on the PTE test. The test must have been taken within the last two years.
- Two letters of reference.
- All post-secondary transcripts.

3. Application Deadline

Deadlines for the submission of complete applications:

- January 15 for September admission and funding

4. Advanced Credit

In the course-based Master’s program, advanced credit may be given for a maximum of half courses at the senior undergraduate (500) level. The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to the required level for admission.

5. Program/ Course Requirements

Master of Strategic Studies

In addition to Faculties of Graduate Studies and Arts requirements, the Centre for Military and Strategic Studies requires:

- That all Master’s students take, in any sequence, the following three core area half courses:
  - Strategic Studies 681 Advanced Analysis of International Relations
  - Political Science 685 Classics of Strategy
  - Political Science 686 Strategic Studies

- That students take, in any sequence, two of the following half courses from the listed areas of concentration:
  1. Arctic Security
  2. Canadian Military Studies
  3. US Security Policy
  4. Domestic Security/Hemispheric Security
  5. Ethics and Morality in Conflict
  6. Intelligence and Security

6. Special Registration Information

- Financial assistance is available to qualified students.
- Information on awards, see the Awards and Financial Assistance section of this calendar.
- Information and deadlines for Medical Science Faculty of Graduate Studies’ award competitions will be provided throughout the year.

7. Financial Assistance

- Financial assistance may be available to qualified students.
- Financial information can be found at http://medicine.ucalgary.ca/research/institutes.

8. Other Information

- None.

9. Research Proposal Requirements

- None.

10. Required Examinations

- See “Medicine Programs” entry.

11. Research Proposal Requirements

- See “Medicine Programs” entry in this Calendar.

12. Research Proposal Requirements

- See “Medicine Programs” entry in this Calendar.

13. Research Proposal Requirements

- None.

14. Research Proposal Requirements

- None.

15. Research Proposal Requirements

- Information about institutes in the Faculty of Medicine can be found at http://medicine.ucalgary.ca/research/institutes.
7. Credit for Undergraduate Courses
Students enrolled in the thesis program may apply to take one 500-level half course for graduate credit, but may be required to complete additional assignments for the course.

8. Time Limit
Expected completion time for the thesis-based and course-based Master of Strategic Studies is two years. Maximum completion time is four years for the thesis-based Master of Strategic Studies and six years for the course-based Master of Strategic Studies.

Expected completion time for the PhD in Military and Strategic Studies is four years. Maximum completion time for the PhD in Military and Strategic Studies is six years.

9. Supervisory Assignments
Students must contact a possible supervisor before admission. Agreement from a supervisor must be included in the application package.

10. Required Examinations
For the PhD program, all course work must be completed, the second language requirement met (if applicable), and a thesis proposal approved by the Supervisory Committee before the candidacy examination can be taken.

There will be two three-hour written examinations, one in each field, as well as the single oral examination covering the content and questions on both of the written exams. There will normally be two fields – a major field and a second field. The major field will always be strategic studies, while the second field will be in an area closely related to the student’s thesis research. Military and Strategic Studies is an interdisciplinary program, and our doctoral students will draw upon a wide variety of disciplines for their second field.

A candidacy examination consists of both written and oral components. CMSS requires that the written component be taken after the completion of course work and no later than 28 months of initial registration into the program, although completion within 16-20 months is encouraged by the Centre. For CMSS purposes, this component will consist of written examinations in the two major fields of study. The oral examination will be held no later than one month after the written examination.

Final thesis oral examinations are open.

11. Research Proposal Requirements
The thesis proposal is submitted to the members of the student’s Supervisory Committee, and the student defends the proposal in a meeting of that Committee. After the proposal is passed by the Committee, the student can go on to write his or her candidacy exams.

12. Special Registration Information
None.

13. Financial Assistance
Not applicable.

14. Other Information
None.

15. Faculty Members/Research Interests
Faculty members and their areas of interest may be found at http://www.cmss.ucalgary.ca.

Music MUSI

Contact Information
Location: Craigie Hall D 100
Fax: 403.282.6825
E-mail address: ikubicek@ucalgary.ca
Web page URL: http://music.ucalgary.ca/graduate/prospective

1. Degrees and Specializations Offered
- Doctor of Philosophy (PhD) with specialization in Musicology, Composition, or Music Education
- Master of Arts (MA) thesis-based with specialization in Musicology
- Master of Music (MMus) thesis-based with specializations in Performance, Conducting, Composition, or Music Education

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires that all applicants submit:
- One-page letter detailing their specific reasons for pursuing graduate study
- Two reference letters

Other requirements are outlined below and based on the degree being pursued.

Master of Music (Performance)
A live audition or video/audio recording. Repertoire for the audition must contain representative works from a variety of historical periods and must demonstrate an advanced level of technical accomplishment. Recordings should be approximately 20-30 minutes in length.

Master of Music (Conducting)
- A completed Bachelor of Music degree, including study in conducting
- Demonstrated ability in an audition, which can be met in two ways:
  - A video of approximately fifteen minutes
  - A rehearsal of a University ensemble (during Fall and Winter)
- Demonstrated competence on a major instrument or voice

Master of Music (Composition)
- A completed Bachelor of Music degree, including study in composition
- A portfolio of at least three recent compositions, together with recordings where available

Master of Music (Music Education)
The Department is not currently accepting applications to the Master of Music (Music Education) for the 2010-2011 academic year.
Program Descriptions

a) Normally, two years of successful teaching experience or equivalent professional involvement in music education
b) An essay on a topic in Music Education prepared during or subsequent to the applicant’s undergraduate work

Master of Arts (Musicology)
A research essay or paper of approximately 10-15 pages on a topic in music history or theory prepared during or subsequent to the applicant’s undergraduate course work.

Doctor of Philosophy
a) A recognized Master’s degree or equivalent
b) Composition - a portfolio of works, together with recordings, if available, and an extended research paper
c) Musicology - one or two extended research essays of approximately 25 pages in length
d) Music Education - one or two extended research essays

3. Application Deadline
The deadline for the submission of complete applications for both Master’s and doctoral programs is January 15 for September admission.

For students wishing to pursue a Master of Music in Performance, an audition of approximately thirty minutes will be arranged on an individual basis from December 1 to April 15. Specific dates and times can be arranged by contacting the Graduate Administrator at 403.220.5383.

For consideration for university scholarships, complete applications (including the auditions and the required TOEFL score, if applicable) must be concluded by January 15. Departmentally-administered funding (such as graduate teaching assistantships and research scholarships) will be decided after April 15.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department, excluding qualifying courses, requires:

Master’s Degrees
Master of Music (Music Education): Music History and Literature 603, 651 and three full approved graduate-level courses
Master of Music (Composition): Music Theory and Composition 671, Music History and Literature 651, Music Theory and Composition 695.01/691 and two full approved graduate-level courses
Master of Music (Performance): Music History and Literature 603, 651, Music Performance 691, 693, one half course at the graduate-level in Music Theory and Composition or Music History and Literature and three other approved half course options
Master of Music (Conducting): Music History and Literature 603, 651, Music Performance 632 or 634 and two full approved graduate-level courses
Master of Arts (Musicology): Music History and Literature 603, 651 and three full approved graduate-level courses

Restrictions
No more than one full course for the Master of Music and Master of Arts degrees may be taken in an area other than Music.

Doctor of Philosophy
Students entering the PhD program will normally be required to complete at least six half courses:
a) An interdisciplinary half course designed by the student and supervisor
b) Five additional approved graduate-level half courses. Students in the Doctor of Philosophy (Composition) program must take Music History and Literature 651 unless this course (or its equivalent) has been completed as part of a Master’s degree.

6. Additional Requirements
Diagnostic examinations in music history and theory will be given to all entering students in order to determine if qualifying work in these areas is required.

Language
Master of Arts (Musicology)
Applicants are required to demonstrate a reading knowledge of a language other than English—normally German. In practice, this requirement and any other linguistic competence that may be deemed necessary for the student’s proposed research are must be met before the thesis topic will be approved.

Other Master’s programs
While there are no formal second-language requirements for the various programs of the Master of Music degree, students may be required to attain proficiency in a language other than English where this is deemed appropriate for the proposed thesis/project.

Doctor of Philosophy
Doctor of Philosophy (Musicology)
Candidates are required to demonstrate a reading knowledge of two languages other than English. German is recommended as one of the required languages.

Doctor of Philosophy (Composition) and (Music Education)
Candidates are required to demonstrate a reading knowledge of one language other than English.

Performance
Graduate students in the MMus Performance program are required to participate in one of the large ensembles for the duration of their degree. Pianists are required to accompany two hours per week in a vocal or instrumental studio if they do not participate in an ensemble. Another option for pianists is to accompany a Junior or a Senior recital.

The head of the performance area will make all ensemble or accompanying assignments. Students in graduate programs other than performance are not required to participate in an ensemble, although such participation is encouraged.

Thesis/Recital/Project
Master’s Programs
All Master’s degree programs require a thesis or recital or project equivalent (see below), prepared under the guidance of a supervisor and approved by the Graduate Studies Committee of the Department.

Master of Music (Performance)
The thesis is interpreted to be two public recitals featuring solo performances and chamber music. At least one Canadian work should be included in one of the recitals. The examining committee will evaluate the candidate’s performance in both of the recitals. Recital proposals are to be submitted to the Graduate Coordinator for approval by the Graduate Committee at least two months before each performance.

Master of Music (Conducting)
The thesis is interpreted to be two public performances, on or off campus, with University or community ensembles.

Master of Music (Composition)
The thesis is interpreted to be a large-scale compositional project and an accompanying descriptive essay related to the project. Normally, the project will be presented in a public recital.

Doctor of Philosophy
Doctor of Philosophy (Composition)
The thesis is interpreted to be a substantial creative project and an accompanying analytical/research paper approved by the supervisory committee.

7. Credit for Undergraduate Courses
Not applicable.

8. Time Limit
Maximum completion time is five years for the Master of Music programs and four years for the Master of Arts (Musicology). Maximum completion time is six years for the doctoral program.

9. Supervisory Assignments
The Graduate Coordinator will function as the interim supervisor for all newly admitted students during their first term. This arrangement will allow students to use their first term as an opportunity to meet with faculty and to secure a permanent supervisor.

10. Required Examinations
Master’s Degrees
Master of Arts (Musicology), Master of Music (Music Education) and Master of Music (Composition)
A comprehensive oral examination encompassing all areas of the chosen field is required. This examination will take place following the completion of coursework and must be satisfactorily completed before the submission of the thesis/project.
Master of Music (Performance) and (Conducting)

A comprehensive oral examination based upon the literature of the instrument and more extensively upon the repertoire of the approved recital programs is required. This examination must be satisfactorily completed at least four weeks before the date of the second public performance required for the degree.

Doctor of Philosophy

This degree requires a candidacy examination with a written and an oral component upon completion of course work, but no later than 28 months after initial registration. Questions on the research proposal will be included in the oral candidacy examination. Final thesis oral examinations of written theses are open.

11. Research Proposal Requirements

Research proposals must be submitted to and approved by the Department’s Graduate Studies Committee at least two months before the student intends to defend or perform. The proposal should include:

- A detailed description of the area of investigation,
- A clear statement of the approach to be taken and the research method to be utilized,
- An account of how the work will be presented,
- An indication of how the project will make an original contribution to the student’s field of study.

12. Special Registration Information

Students should consult the Graduate Coordinator before registering.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. For scholarship applications, see Application Deadlines.

14. Other Information

International applications will not be considered unless the applicant has completed and passed the TOEFL examination (or equivalent) before the application or scholarship deadline. Students must apply for the Open Scholarship Competition by January 15.

15. Faculty Members/Research Interests

Current faculty members and their areas of interest can be found at http://music.ucalgary.ca/contact-us/directory.

Nursing NURS

Contact Information

Location: Professional Faculties Building, Room 2279
Faculty number: 403.220.6241
Fax: 403.284.4803
E-mail address: nursgrad@ucalgary.ca
Web page URL: http://nursing.ucalgary.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Nursing (MN), course-based or thesis-based
Integrated Master of Nursing/Nurse Practitioner (MN/NP)
Post-Master's Nurse Practitioner Diploma (PMNP)

The Doctor of Philosophy program is designed to educate professionals for excellence in nursing scholarship through original research related to specialized practice with identified client populations.

Master of Nursing programs prepare advanced nurse practitioners in specialized areas of practice. The course-based program prepares nurses with advanced skills; the thesis-based program offers supervised research experience.

A Post-Master's Nurse Practitioner (PMNP) diploma program, with an adult health acute care focus, is offered. The PMNP can be achieved as a Post-Master’s program or through an integrated Master of Nursing/Nurse Practitioner (MN/NP) program. The Nurse Practitioner program or any of its courses will only be offered contingent on the availability of resources and a sufficient cohort of students. Further information on the integrated MN/NP program can be found at http://nursing.ucalgary.ca.

2. Admission Requirements

In addition to the Faculty of Graduate Studies requirements, the Faculty of Nursing requires that an applicant must:

Master of Nursing

a) Be a Registered Nurse holding a baccalaureate degree, normally in nursing;
b) Be eligible for active nursing registration in Alberta (registrants in the program must provide proof of active CARNA registration or equivalent each year);
c) Hold CPR Certification at the Basic Rescuer or Basic Cardiac Life Support or “C” level;
d) Have successfully completed one undergraduate half course in research methodology equivalent to University of Calgary Nursing 309 or 559;
e) Have successfully completed one undergraduate half course in statistics;
f) Normally have a minimum of two years’ (full-time or equivalent) clinical experience in the proposed area of study. Applicants to the MN/NP and PMNP programs must provide documentation from their employer confirming they have met the three years’ experience;
g) Submit two references, one from someone capable of assessing the applicant’s academic and research ability, normally an academic, and one from someone who can attest to the applicant’s nursing practice and expertise;
h) For applicants required to provide proof of proficiency in English submit a minimum TOEFL score of 600 (written test) or 100 (Internet-based test); IELTS score of 7.0; MELAB score of 83; PTE score of 70; or Level 3 on the EAP program;
i) Have an interview(s) with a faculty member, if requested by the Faculty.

A minimum of three years’ (full-time or equivalent) Registered Nurse practice experience in the proposed area of study is required for applicants to the MN/NP or the PMNP. These applicants must also provide commitment from the Health Region for practicum placement availability for the final practicum of the NP program (Nursing 650).

Any graduate student requesting transfer to the integrated MN/NP program must consult with his/her current supervisor prior to application. Applicants to the MN/NP can be admitted on a part-time basis up to the commencement of the first NP practicum (Nursing 641) at which time a transfer to full-time studies must occur.

Doctor of Philosophy

a) Normally be a Registered Nurse;
b) Normally hold CPR Certification at the Basic Rescuer or Basic Cardiac Life Support or “C” level;
c) Submit a study plan outlining the areas of proposed concentration, goals in undertaking doctoral work, initial intentions regarding course work, and a statement of the preliminary plans for thesis research;
d) Provide examples of the applicant’s written scholarly work such as publications, research reports, course assignments, etc;
e) Provide a curriculum vitae;
f) Provide a letter of commitment from the identified supervisor indicating willingness to provide supervision throughout the program of studies and supporting the applicant’s study plan;
g) For applicants required to provide proof of proficiency in English submit a TOEFL score of 600 (written test) or 100 (Internet-based test); IELTS score of 7.0; MELAB score of 83; PTE score of 70; or Level 3 on the EAP program;
h) Have successfully completed one graduate-level half course in quantitative methods, one graduate-level half course in qualitative methods, plus one graduate-level half course in statistics. Exceptions may be considered, but the onus will be on the applicant to provide sufficient evidence to warrant exception. Deficiencies must be successfully eliminated prior to or in the first year of the Doctoral Program;
Program Descriptions

Post Master’s Nurse Practitioner Diploma

a) Successful completion of prerequisite courses: Nursing 661, 663, 665
b) Successful completion of the following core NP courses: Nursing 641, 644, 646, 650, 667

For the Nurse Practitioner practicum component of the integrated MN/NP and for the PMNP, there are additional requirements:

- Mandatory participation of NP students in all activities related to practicum courses.
- NP students’ practicum experiences may be scheduled at various hours, including evenings, nights and weekends. Practicum experiences may also extend outside the normal academic term. Normally, a student will not be permitted to withdraw from a NP practicum course in order to avoid a failing grade in that course.

Master of Nursing (thesis-based)

a) At minimum successful completion of the following core courses: Nursing 605, 611, 621, 675, 683
b) One graduate-level half course in statistics (Statistics 603)

Evaluation of nursing practicum will be weighted at 40% of the final grade across all of the practica in the MN course-based and MN thesis-based programs, with a weight of 60% for the seminar component.

Doctor of Philosophy

a) For students prepared at the Master’s level in nursing a minimum of six half courses is required: Nursing 705, 769, two courses in advanced research methods at the 700 level, and two doctoral thesis seminars (Nursing 711 and 733)
b) Students in the doctoral program normally are required to take advanced research methods courses at the 700 level in both qualitative and quantitative research approaches, one of which must be Nursing 721 or 783
c) After completion of the student’s course work and approval of the thesis research proposal, a candidacy examination with a written and an oral component is required. Baccalaureate and non-nursing Master’s prepared applicants must complete additional coursework beyond the six core half courses listed in (a). Applicants are individually assessed. The number and types of additional courses required will vary according to the applicant’s academic, research and practice background as well as the proposed research plan.

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

Under special circumstances, with the consent of the Faculty, students may take undergraduate courses, normally at the senior or 500 level, for the Master of Nursing degree.

8. Time Limit

Expected completion time for full-time students in the Master of Nursing program is two years. Maximum completion time is four years for the thesis-based program and six years for the course-based program including the MN/NP. The PMNP is one year, full-time study. Expected completion time for doctoral students is four years; maximum completion time is six years.

9. Supervisory Assignments

a) In addition to normal regulations for assignment of supervisors in the MN program, a supervisory committee must be struck for all MN thesis students no later than three months after the appointment of supervisor.
b) Normally the Faculty of Nursing supervisor for an MN/NP or PMNP student is a member of the Nurse Practitioner Committee.
c) Doctoral students require a Faculty of Nursing member to commit to their supervision as a condition of admission.

10. Required Examinations

Master of Nursing (course-based)

A final comprehensive examination consists of a take-home written exam, designed according to the student’s specialization, and an oral component. The written component must be completed within one week and constitutes the basis for a final oral examination two weeks later.

For the Nurse Practitioner component of the integrated MN/NP, all courses, with the exception of Nursing 650, must be completed prior to the MN comprehensive examination. The final exam in the MN/NP and the PMNP includes an experiential practice component and an oral examination.

Master of Nursing (thesis-based)

The final oral thesis examination is open.

Doctor of Philosophy

The doctoral candidacy examination has a written and an oral component. The written component focuses on three areas:

a) the theory that defines existing knowledge in the student’s chosen area of nursing research;
b) the literature that defines existing knowledge in the student’s chosen area of nursing research;
c) the proposed research method and data analysis/management strategy chosen for the thesis. The student has three weeks to complete the written component. The candidacy committee has approximately two weeks to review the written submission before the oral examination.

The student is expected to defend and extend his/her knowledge in these three areas. Questions about the student’s proposed research may be asked.

The final doctoral oral thesis examination is open.

11. Research Proposal Requirements

Doctoral students must have their research proposals approved in principle by their supervisory committee prior to candidacy. Students must receive formal approval of their research proposals from the supervi-
sory committee before proceeding to ethical review and implementation of the project. The approved proposal will be housed in the Research Office, Faculty of Nursing.

Students whose research involves human subjects must receive ethics approval from the University of Calgary Conjoint Health Research Ethics Board.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Scholarships application packages will be available on the Faculty of Nursing Website prior to each competition deadline. The application deadline for internal scholarships is February 1. Students admitted to the doctoral program are highly encouraged to seek external funding to support their studies and research. Please note that the deadlines for external funding applications may not coincide with the February 1 deadline.

14. Other Information
None.

15. Faculty Members/Research Interests
Current faculty and their research interests can be found at http://nursing.ucalgary.ca/contact-us/directory.

Philosophy PHIL

Contact Information
Location: Social Sciences Building, Room 1248
Faculty number: 403.220.5533
Fax: 403.289.5698
E-mail address: philgrad@ucalgary.ca
Web page URL: http://www.phil.ucalgary.ca

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), course-based (full and part-time) and thesis-based (full-time)
The Department also offers a Master of Arts degree with a specialization in the History and Philosophy of Science and a Master of Arts degree with a specialization in the Philosophy of Religion. These two degrees are offered in cooperation with the Departments of History and Religious Studies respectively.

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires three letters of reference, and a sample of written work, such as a recent essay, written in English. Applications will not be considered without a sample of written work.

3. Application Deadline
The deadline for submitting complete applications is January 15 for September admission.
Candidates applying for financial assistance should ensure that all documents relevant to their scholarship application reach the Department by January 15. The Department makes its first round of decisions for financial support by the end of March. Although most applications are for September admission, January admission is also possible.

4. Advanced Credit
The Department does not normally give advanced credit for courses taken previously. However, in special circumstances, a request for advanced credit may be considered if it is made as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to raise the grade point average to a level required for admission. Normally, advanced credit may be given for a maximum of three half-course equivalents.

5. Program/Course Requirements
Note: Normally, in both Master’s and Doctoral programs, no more than one half course of Directed Reading can be taken to satisfy the minimum course requirement.
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:
Master of Arts (thesis-based)
(a) A minimum of six half-course equivalents
(b) In the specializations History and Philosophy of Science or Philosophy of Religion, courses taken in History or Religious Studies, may, with departmental approval, count as fulfilling course requirements for the degree
Master of Arts (thesis-based) with Specialization in the History and Philosophy of Science
(a) Two half-course equivalents (two terms) in the philosophy of science
(b) Two half-course equivalents (two terms) in the history of science
c) Two half-course equivalents (two terms) in the history and philosophy of science
d) Proficiency in a second language or logic, depending on the department of enrolment
Master of Arts (course-based)
(a) A minimum of ten half courses, including at least two half courses in the History of Philosophy and two half courses in 20th Century or Contemporary Philosophy
(b) Students to remedy background deficiencies, if any, in a certain area or areas of philosophy by taking course work below the 500-level
(c) Students must complete at least one half course in each annual registration period
Doctor of Philosophy
(a) Normally, a minimum of six half courses for students with a Master of Arts degree
b) Normally, a minimum of twelve half courses for students entering directly from an honours undergraduate program
c) Students to show competence in logic, which may be done by achieving a grade of "B" or better in Philosophy 379

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Normally, no undergraduate courses will be credited towards completion of course requirements in a graduate program.

8. Time Limit
Expected completion time for full-time students is two years in a Master’s thesis program, three years in a Master’s course-based program, and four years in a doctoral program. Maximum completion time is four years for a Master’s thesis program, and six years for a Master’s course-based or doctoral program.

9. Supervisory Assignments
Students are assigned an interim advisor until they have an opportunity to become acquainted with other members of the faculty. Each student must have a supervisor by the end of the second regular academic session after first registration (April for September registrants and December for January registrants) and well in advance of the student’s determination of areas for the final examination. The choice of supervisor must be by mutual arrangement between the student and staff member concerned, and approved by the Department.
A supervisory committee at the Master’s level is not normally appointed. When such a committee is deemed necessary, the Dean’s approval must be obtained.
A doctoral student shall be under the general supervision of a supervisory committee. After consultation with the student, the supervisor will submit a list of possible members of the supervisory committee to the Graduate Studies Committee for approval. The supervisory committee must be appointed as soon as possible and no later than three months after the supervisor’s appointment.

10. Required Examinations
Doctor of Philosophy
Departmental Preliminary Examinations
Students will be required to show competence in three of the following four areas:
Area I – metaphysics and epistemology
Area II – history of philosophy
Area III – philosophy of language and logic
Area IV – moral and political philosophy
The student chooses three areas. Competence in an area is shown by submitting a satisfactory essay or passing an examination. At least one area must be passed by either a sit-down or take-home examination. Exams are administered, and essays accepted, four times yearly. All three areas must be passed within 20 months of regis-
Program Descriptions

Master of Arts (course-based)
The course-based Master of Arts has a research constituent. This constituent is to be satisfied by passing all components, written and oral, of the final Master’s examination.

A final Master’s examination of overall competency is required after completion of all course work, consisting of written and oral components. Effective July 1, 2009, the Department of Philosophy will be monitoring and overseeing this examination.

a) Details of the written component:
   i. The written component will consist of two three-hour written examinations. The written examinations are to be completed within one week.
   ii. The written component of the examination must be judged to be either acceptable (‘Pass’) or unacceptable (‘Fail’).
   b) The student shall not be permitted to proceed to the oral component if the student does not secure a ‘Pass’ on the written component.
   c) The oral examination will be held within two weeks following the written component. The oral examination will not be limited to the questions in the written examinations but will test the student’s general knowledge of the areas selected for examination.
   d) Details of the oral component:
      i. The oral examination is a formal examination, not an informal discussion with the student.
      ii. All examiners must be given an opportunity to question the student early in the examination, e.g. by rounds of questioning.
      iii. The oral examination shall not exceed two hours. This does not include deliberation time of the committee.
      iv. The oral component of the examination must be judged to be either acceptable (‘Pass’) or unacceptable (‘Fail’).
      e) Each examiner is required to submit a written assessment of the student’s written examination performance, to be submitted to the Chair of the examination committee prior to the examination.
      f) The result of the Final Master’s Examination shall be either ‘Pass’ or ‘Fail’. To secure a ‘Pass’, the student must obtain a ‘Pass’ on both the written component and the oral component of the exam. In the event of a failure, the examining committee may recommend that the student be given an opportunity to take the failed component of the examination again between two and six months from the date of the first attempt. No more than two attempts will be permitted.

Thesis Programs
The candidacy exam has a written component, the student’s research proposal. This proposal must be submitted to all members of the candidacy examining committee at least two weeks before the examination. The candidacy oral can include questions on the research proposal.

Thesis oral examinations are open.

11. Research Proposal Requirements
The research proposal is to be submitted in accordance with Faculty of Graduate Studies requirements.

12. Special Registration Information
Incoming students meet with the Department of Philosophy Graduate Director to discuss their programs and to decide which courses to take.

13. Financial Assistance
Most thesis students admitted to the program receive some level of financial support from the Department. Suitable qualified Master’s students may be given a guarantee of financial support from September of their first year to the end of April of their second year. All doctoral students receive a guarantee of financial support for the four years of their program.

For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Department by January 15.

14. Other Information
None.

15. Faculty Members/Research Interests
The faculty’s main interests and specialties can be found at: http://www.phil.ucalgary.ca/people/.

Physics and Astronomy

PHAS
Contact Information
Location: Science B, Room 605
Faculty number: 403.220.3617
Fax: 403.289.3331
E-mail address: gradinfo@phas.ucalgary.ca
Web page URL: http://www.phas.ucalgary.ca

1. Degrees and Specializations
   Offered
   Doctor of Philosophy (PhD)

Master of Science (MSc), course-based and thesis-based

Areas of specialization: Astrophysics, Medical Physics, Physics, Radiation Oncology Physics, and Space Physics

Post-PhD Diploma in Radiation Oncology Physics

2. Admission Requirements
In addition to Faculty of Graduate Studies and Faculty of Science requirements, the Department requires:

a) A University of Calgary Honours background in Physics, Engineering Physics, Astronomy/Astrophysics, or equivalent;

b) For some applicants, a satisfactory score on the Advanced Physics Graduate Record Examination;

c) Two reference letters.

Master of Science
Applicants to the Master of Science program, whose background does not include the equivalent of an undergraduate honours degree in the proposed area of study, may require additional make-up courses. Such applicants should consult with the department regarding their admission status.

Doctor of Philosophy
For the Post-PhD Diploma program, applicants must possess a PhD from a CAMPEP accredited graduate program or equivalent and an appointment as an Associate Medical Physicist by the Alberta Cancer Board.

3. Application Deadline
Deadlines for the submission of complete applications:
March 1 for September admission
July 1 for January admission

Late applications will be considered if any openings remain in the graduate program.

4. Advanced Credit
The applicant must make advanced credit requests as part of his admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies and Faculty of Science requirements, the Department requires:

That all students, with the exception of registrants in the Post-PhD Diploma program, register in the Graduate Seminar, Physics 691, during Fall and Winter Terms of the first two years in program.

Master of Science (thesis-based)

a) For students specializing in Astrophysics, Physics, or Space Physics, four half-course equivalents, including at least two of Physics 609, 611, 613, and 615, plus two elective courses at the 500 or 600 level, as approved by the Graduate Chair

b) For students specializing in Medical Physics, five half-course equivalents, including Medical Physics 623, 625, at least two of
Physics 609, 611, 613, and 615, plus one elective courses at the 500 or 600 level, as approved by the Graduate Chair.

c) For students specializing in Radiation Oncology Physics, eight half-course equivalents, including Medical Physics 623, 625, 633, 637, 639, 689.01, and two of Physics 609, 611, 613, and 615.

Master of Science (course-based)

This program may be taken part-time or full-time.

a) That the student choose one of the three broad areas of specialization: astrophysics, physics, or space physics. Medical physics and Radiation Oncology Physics are not available as a course-based degree.

b) Ten half-course equivalents, including Physics 603, 605, 609, 611, 613, 615.

c) Four half-course equivalents, depending upon the area of specialization:

   - Astrophysics – Astrophysics 699 plus three half-course equivalents labelled ASPH (two of these may be at the 500 level). Physics 629 and Space Physics 679 may be taken instead of Astrophysics courses.

   - Physics – Physics 699 plus two half-course equivalents labelled ASPH, PHYS, or SPPH (these may be at the 500 level) plus one half-course equivalent labelled PHYS, at the 600 level or above.

   - Space Physics – Space Physics 699 plus three half-course equivalents labelled SPPH, at the 600 level or above. Physics 509 may replace a SPPH course.

d) A comprehensive examination with a written and oral component.

Doctor of Philosophy

a) A minimum of two half-course equivalents at the 600 level or higher for those who hold a Master’s degree.

b) A minimum of six half-course equivalents at the 600 level or higher for those entering the doctoral program without a Master’s degree.

c) For students specializing in Radiation Oncology Physics who do not hold an accredited M.Sc. degree in Radiation Oncology Physics, Medical Physics 623, 625, 633, 637, 639, and 689.01, and two courses from Physics 609, 611, 613, or 615.

Post PhD Diploma

Eight half-course equivalents including Medical Physics 711, 712, 721, 722, 731, 741 and two of Human Resources and Organizational Dynamics 793, 741 or Strategy and Global Management 797.01.

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

Credit for a maximum of two half-course equivalents may be given for courses taken at the 500 level.

8. Time Limit

Expected completion time is two years for full-time students in a thesis Master’s program, three years in a course-based program, four years in a doctoral program, and two years in the Post-PhD Diploma program. Maximum completion time is four years for a thesis Master’s program, and six years for a course-based Master’s or a doctoral program.

9. Supervisory Assignments

Newly admitted students will normally be supervised by the Graduate Director or an interim supervisor in their field of interest during the first year in program. During this time students will normally complete all of the course work and have an opportunity to become acquainted with the research of potential supervisors within the department. Students are responsible for securing a permanent supervisor from among the researchers in the department within the first four months in program. Registrants in the Post-PhD Diploma program are supervised by the Director of Medical Physics or designate, Tom Baker Cancer Centre. The MSc program has a supervisory committee requirement which follows the same requirements and rules as the PhD.

10. Required Examinations

Master of Science (course-based)

Two weeks before the comprehensive oral examination, students must write a three-hour, closed-book comprehensive examination, prepared by the Departmental Graduate Affairs Committee in collaboration with the supervisor. The examination will normally be conducted during May or June, and again in December. Students who fail the examination the first time will retake it during the next sitting of the examination. A second failure will result in the withdrawal of the student from the doctoral program.

Doctor of Philosophy

Students are required to write a qualifying examination within their first year in program. This uniform examination, taken by all students, examines the student’s background in undergraduate physics at the honours level. The examination will normally be conducted during May or June, and again in December. Students who fail the examination the first time will retake it during the next sitting of the examination. A second failure will result in the withdrawal of the student from the doctoral program.

Students are required to complete the oral candidacy exam. This exam may include questions on the written examination, general research knowledge and thesis proposal. Final thesis defence is required. The oral thesis defence is open.

11. Research Proposal Requirements

Students entering a doctoral program with a completed Master’s degree must submit a written thesis proposal within 24 months of initial registration. Students entering a doctoral program with a Bachelor’s degree, or who have transferred into the doctoral program from a Master’s program, must submit a written thesis proposal within 28 months.

12. Special Registration Information

Registration in the Post-PhD Diploma program is contingent upon employment by the Alberta Cancer Board as an Associate Medical Physicist.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, please see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships must submit their applications to the Department by February 1.

14. Other Information

See the Department website.

15. Faculty Members/Research Interests

The active research interests of the staff can be found at http://www.ucalgary.ca/physics/.

Astronomy and Astrophysics:
http://courses.phas.ucalgary.ca/astro/

Environmental Physics:
http://courses.phas.ucalgary.ca/~annilsen/

Complexity Science:
http://www.ucalgary.ca/complexity/

General Relativity:
http://courses.phas.ucalgary.ca/astro/

Isotope Science:
http://www.ucalgary.ca/uofcisl/

Medical Physics:
http://www.cancerboard.ab.ca/tbcmedefphys/

http://www.med.ucalgary.ca/mrcentre

Quantum Optics:
http://iqis.org/; and
http://qis.ucalgary.ca/QO/

Space and Plasma Physics:
http://www.phys.ucalgary.ca/
Program Descriptions

2. Admission Requirements

In addition to the Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts

a) A minimum grade point average of 3.40 on a four-point scale over the last ten full-course equivalents taken in the applicant’s undergraduate program.
b) Normally a BA in Political Science or a strong background in Political Science of at least 5 full-course equivalents in Political Science. Special consideration may be given to those who have not achieved this background.
c) All students whose native language is other than English are required to pass the TOEFL with a minimum score of 620 (paper-based), or 105 (Internet-based), or 7+ on the IELTS, or 87 on the MELAB, or 75 on the PTE.
d) Two reference letters.
e) A statement of research interests.
f) Sample of written work, preferably a paper submitted for a Political Science course.
g) Email confirmation from a potential supervisor who is interested in supervising your work.

Doctor of Philosophy

a) A minimum grade point average of 3.70 on a four-point scale over completed graduate courses.
b) Normally a Master of Arts in Political Science or a strong background in Political Science. Special consideration may be given to those who have not achieved this background.
c) All students whose native language is other than English are required to pass the TOEFL with a minimum score of 620 (paper-based), or 105 (Internet-based), or 7+ on the IELTS, or 87 on the MELAB, or 75 on the PTE.
d) Two reference letters.
e) A statement of research interests.
f) Sample of written work, preferably a paper submitted for a Political Science course.
g) Email confirmation from a potential supervisor who is interested in supervising your work.

3. Application Deadline

Deadline for the submission of completed applications is January 15.

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not normally be given for course work taken as part of another completed degree/diploma. If graduate-level courses are taken as post-BA courses, the Graduate Program Director will allow the student to claim up to two half courses at our graduate level.

5. Program/Course Requirements

In addition to the Faculties of Graduate Studies and Arts requirements, the Department normally requires that all students complete Political Science 691. In addition:

Master of Arts

a) Master of Arts students must complete a minimum of five half courses:
   - At least two half courses must be taken in the Political Science Department at the University of Calgary
   - Two or three courses will be in the student’s major field (one of Canadian Politics, Comparative Politics, International Relations, and Political Thought)
   - A maximum of one half course can be a reading course
b) Master of Arts students must demonstrate a basic knowledge of research methods equivalent to Political Science 691. If students are required to take Political Science 691, it will be included in these five half courses. Students who have an equivalent of Political Science 691 will still be required to take five half courses.

Doctor of Philosophy

a) Doctoral students must complete a minimum of six half courses:
   - At least four half courses must be taken in the Political Science Department at the University of Calgary
   - One full-course equivalent in each of the student’s two major fields (i.e., Canadian Politics, Comparative Politics, International Relations, or Political Thought)
   - A maximum of two half courses may be reading courses
   - Language courses will not be considered part of the six half course requirement
   - PhD Students must demonstrate a basic knowledge of research methods equivalent to Political Science 691. If students are required to take Political Science 691 it will not be considered part of the six half-course equivalent.
   - b) A candidacy examination with a written and oral component, normally completed within sixteen months of first registration.
   - c) A thesis proposal, normally defended within four months of the oral candidacy exam.
   - d) A demonstration of reading proficiency in a language other than English, as determined by the supervisory committee. Normally students without prior reading proficiency will be required to achieve a grade of at least “B” in one full-course equivalent in a second language.

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

The department does not give graduate credit for courses taken below the 600-level, except in special cases.

8. Time Limit

Maximum completion time is four years for a Master’s program and six years for a doctoral program.

9. Supervisory Assignments

Master of Arts

Wherever possible, an incoming student should have a specific supervisor in mind when applying for the program and should initiate supervisory arrangements with this faculty member. A supervisor is determined as a result of consultations involving the student and the Graduate Director (and/or Department Head), normally within the first term of the student’s program, but the supervisor must be appointed within 12 months of initial registration.

Doctor of Philosophy

Wherever possible, an incoming student should have a specific supervisor in mind when applying for the program and should initiate supervisory arrangements with this faculty member. Supervisory arrangements are normally completed within the first six months of the doctoral program, but the supervisor must be appointed within 12 months of initial registration. Where the matter of supervision is still under consideration, the Graduate Director usually serves as interim supervisor until a final decision is made.

Supervisory committees for doctoral students are struck as the result of consultations amongst the student, supervisor, and Graduate Director (and/or Head) and must be established as soon as possible and no later than three months after the supervisor’s appointment.

10. Required Examinations

The doctoral candidacy examination has a written and an oral component. The Department requires two written candidacy examinations, one in the student’s field of thesis research and the other in the student’s second chosen field of study. The examinations test the student's general knowledge of the fields as well as specific topics within these fields. Examinations are usually three hours long and are scheduled in each of the fall and winter terms at suitably arranged times.

11. Research Proposal Requirements

Doctoral students must submit and defend a written thesis proposal (no more than 20 pages in length) for approval by the supervisory committee.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Department by January 15.

14. Other Information

None.
Psychology PSYC

Contact Information
Location: Administration Building, Room 275
Faculty number: 403.220-5659
Fax: 403.282-8249
E-mail address: psycgrad@ucalgary.ca
Web page URL: http://psychology.ucalgary.ca/

The Department of Psychology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees in psychology and in clinical psychology. These degree programs are described separately in the links below.

Psychology (PSYC) Program

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based

2. Admission Requirements

The Department accepts applicants who plan to remain full-time to the completion of their degree. The program does not offer a part-time option.

In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

- A four-year undergraduate degree in Psychology or related discipline.
- A minimum admission grade point average of 3.40 on a four-point scale over the last 20 half courses.
- An undergraduate course in statistics/experimental design.
- An acceptable score on the Graduate Record Examination (Verbal, Quantitative, and Analytical) for students with an undergraduate degree in Psychology. Students not having an undergraduate degree in Psychology must also write the Psychology Subject Test.
- For applicants required to provide proof of proficiency in English, a TOEFL score of 600 (written test), or 100 (Internet-based test), an IELTS score of 7.5, a MELAB score of 84, or a PTE score of 70.
- Two reference letters.

3. Application Deadline

Deadlines for the submission of completed applications:
- January 15 for May or September admission
- October 1 for January admission

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements

In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

- **Master of Science**
  - Master’s students must take no fewer than six half courses, two of which must come from Psychology 607, 611, 613, 615, 617, or 619; and two of which must come from Psychology 620, 630, 700, 710, 720, 730, or 739 (these courses may be repeated for credit), over their 24-month program.

- **Doctor of Philosophy**
  - Doctoral students shall take no fewer than six half courses while in the program. The Supervisor and the Director of Graduate Studies, Department of Psychology, must approve all courses. Incoming doctoral students must demonstrate that they have an adequate background in statistics and methodology (including computer applications). Those needing remedial work may be required by the Department of Psychology to take particular courses.

6. Additional Requirements

None.

7. Credit for Undergraduate Courses

Credit may be given for 500 level undergraduate courses.

8. Time Limit

Expected completion time is two years for the Master of Science program and three years for the doctoral program. (Particular circumstances can be taken into account.)

9. Supervisory Assignments

An interim supervisor is assigned to each student at the time of admission. In no case will a student be admitted if an appropriate supervisor is not expected to be available. The shift from interim to permanent supervisor formally takes place at the end of the first year. The Director of Graduate Studies, Department of Psychology, must approve the permanent supervisor.

10. Required Examinations

A doctoral student will normally be required to take the candidacy examination within the first 17 - 20 months of the program. The candidacy examination has a written and oral component. The written examination consists of a thesis research proposal that must be typed and 10 to 30 double-spaced pages (12 pt font, reference list extra). Students must consult their supervisors. The oral examination questions will be based on the written thesis proposal and the candidacy reading list.

Final thesis oral examinations are open.

11. Research Proposal Requirements

Students whose research involves human subjects must receive approval from the appropriate departmental or University Ethics Review Committee before beginning data collection.

All Master of Science students must formally present a thesis proposal not more than 14 months after admission to the program. The proposal must be typed and 10 to 30 double-spaced pages (12 pt font, reference list extra). Students must consult with their supervisors. The supervisory committee must approve the thesis proposal.

All Doctor of Philosophy students must formally present a thesis proposal not more than 16 months after admission to the program. The proposal must be typed and 10 to 30 double-spaced pages (12 pt font, reference list extra). Students must consult with their supervisors. The supervisory committee must approve the thesis proposal.

12. Special Registration Information

None.

13. Financial Assistance

Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships are advised to submit their applications to the Department by January 15.

14. Other Information

Initial inquiries may be made to the Director of Graduate Studies, Department of Psychology.

15. Faculty Members/Research Interests

The active research interests of the faculty can be found at http://www.psychology.ucalgary.ca.

Clinical Psychology (CPSY) Program

Contact Information
Location: Administration, Room 275
Faculty number: 403.220.5659
Fax: 403.282.8249
E-mail address: psycgrad@ucalgary.ca
Web page URL: http://www.psychology.ucalgary.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based

The purpose of the graduate program in Clinical Psychology is to prepare students for careers as doctoral-level clinical psychologists in research, academic, and applied settings. In the course of doctoral training, students also are required to complete the
Master of Science (MSc) degree. However, consistent with its goal of doctoral training, the program only admits students who wish to pursue the doctoral degree.

Students registered in Master’s thesis-based and doctoral programs will be considered full-time. The program does not offer a part-time option.

2. Admission Requirements
In addition to the Faculties of Graduate Studies and Arts requirements, the program requires:

a) An honour’s degree in psychology (or equivalent) with a minimum grade point average of 3.60 on a four-point scale in the last 10 full courses to be considered for entry, although competition for the program is such that higher grade point averages are typical of students who are admitted.
b) Scores on the Aptitude (Verbal/Quantitative) dimensions of the Graduate Record Examination (GRE). Please note that students with scores less than the 50th percentile on the Verbal and Quantitative subtests will not normally be admitted.
c) A statement of research and professional interests, including the specification of prospective research supervisors from among current Program faculty.
d) For applicants required to provide proof of proficiency in English, a TOEFL score of 600 (written test), or 100 (Internet-based) test, or an IELTS score of 7.5, or a MELAB score of 84, or a PTE score of 70.
e) Two reference letters.

3. Application Deadline
The deadline for complete applications is January 7 for September admission.

4. Advanced Credit
Advanced credit may be given for up to two full-course equivalents of graduate work, if this work is consistent with the program’s requirements.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

The Program outline is as follows:

Year 1
- Psychology 650, 651, 653, 659, 660, 671, 673, 615, thesis work

Year 2
- Psychology 601, 650, 681, 683, plus a graduate-level Psychology Statistics course or Methodology course (Psychology 617 or equivalent), completion of the thesis

Year 3
- Psychology 750, 760, a graduate-level breadth course, elective, the Candidacy Examination, thesis work

Year 4
- Psychology 750, 762, thesis work

Year 5
- Pre-Doctoral Clinical Internship Psychology 798, and completion of thesis oral and written requirements
- Breadth course requirements may be satisfied through Psychology 750 and courses offered by the Department of Psychology. A list of approved breadth courses is available through the Graduate Psychology Program Office.
- The prerequisite for all Clinical Program courses (unless otherwise noted) is consent of the Program.
- Successful completion of years one and two, plus the Master of Science thesis, constitute the requirements of the Master of Science degree. Program students must formally apply and be approved by the program and the Faculty of Graduate Studies for admission to the doctoral program upon completion of Master of Science requirements.

6. Additional Requirements
Clinical suitability and professional conduct.

7. Credit for Undergraduate Courses
Credit for one breadth course may be given if the applicant has two senior undergraduate courses in that area. Credit for Psychology 601 may be given if the applicant has a senior undergraduate course in History and Systems of Psychology.

8. Time Limit
It is expected that students will complete the MSc thesis within two years. Students in the MSc program must complete all requirements within four registration years. Students who have taken three years to complete all requirements for the Master’s degree will normally not be admitted into the doctoral program. It is expected that students will complete the Doctoral Program within 5 years. Maximum time to completion for the MSc is 4 years and for the Doctoral Program is 6 years.

9. Supervisory Assignments
Program students must have a research supervisor at all times. Supervisors are arranged by mutual consent of student and faculty member, and are consistent with the focus of the student’s research work. Master’s level students must have a supervisory committee consisting of at least three members, with at least one who is a member of the core clinical faculty. Doctoral candidates must have a supervisory committee of at least three members.

10. Required Examinations
In addition to course-specific written requirements, students must sit a written and oral doctoral candidacy examination in the third year of their program (i.e., the first year of doctoral studies). The oral candidacy exam will focus on questions on general clinical psychology and research knowledge. Questions on the research proposal will not be included in the oral candidacy examination.

Final thesis oral examinations are open. A thesis final defence is also required.

11. Research Proposal Requirements
Students in the program must complete both a Master’s thesis and doctoral thesis, according to the criteria set by the Faculty of Graduate Studies. These research projects typically involve the design of a research question and research project, the collection, analysis and interpretation of original data, and the preparation of a written document consistent with good scholarship. Students whose research involves human subjects must receive approval from the appropriate departmental or University Ethics Review Committee before beginning data collection.

12. Special Registration Information
Admission to this Program is normally only available in September of each year.

13. Financial Assistance
Financial assistance may be available to qualified students. Applicants and program students are strongly encouraged to apply for internal and external awards. For information on Awards, see the Awards and Financial Assistance section of this Calendar.

15. Faculty Members/Research Interests
Research and clinical interests of the Program faculty can be found at http://psychology.ucalgary.ca/research/groups.

Public Policy PPOL
Contact Information
Location: School of Public Policy
Room 926, Earth Sciences Blvd
Faculty number: 403.210.6112
Fax: 403.210.6939
E-mail address: mpp@ucalgary.ca
Web page URL: www.poliscy.ualberta.ca

1. Degrees and Specializations Offered
Master of Public Policy (MPP), course-based
The MPP is a 12-month program offered for full-time study.

2. Admission Requirements
Master of Public Policy
In addition to the Faculty of Graduate Studies requirements, the School requires:

a) A minimum 3.30 grade point average (on the four-point scale) in the last two years
of program or over the last ten full-course equivalents;
b) A current resume;
c) A personal statement outlining the applicant’s career goals and how the applied-for program would help achieve those goals;
d) For students required to prove proficiency in English, a minimum TOEFL score of 600 (written test), 250 (computer-based test) or 100 (Internet-based test) or a score of 7.0 on the IELTS.

**Doctor of Philosophy (PhD)**

Applicants wishing to undertake a doctoral program on a special case basis should contact the School of Public Policy.

### 3. Application Deadline

Deadline for the submission of completed applications is April 15 for Canadians and Permanent Residents of Canada and March 1 for International Students.

### 4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not normally be given for course work taken as part of another completed degree/diploma. If graduate-level courses are taken as post-BA courses and not used as credit towards another degree, the School may allow the student to claim up to two half courses at our graduate level towards the MPP requirements should the student be admitted into the MPP program.

### 5. Program/Course Requirements

In addition to the Faculty requirements, the School requires that all students complete the following:

**Master of Public Policy**

- **a)** Two preparatory/foundation courses (Public Policy 601 and 603) during the last two weeks of August and during Fall Block Week prior to the start of the Fall Term. Satisfactory performance in these courses is required for continuation in the MPP program. Exemptions will normally be given for these two preparatory/foundation courses to those who have completed courses with a grade of “B” or better in economics, mathematics, and statistics offered by a recognized undergraduate program within the past 5 years.
- **b)** An effective writing and research course (Public Policy 613) during the January Block Week.
- **c)** The following eight core courses:
  - Public Policy 605: Markets and Public Policy
  - Public Policy 607: Politics and Collective Choice
  - Public Policy 609: Decision Analysis
  - Public Policy 615: Public Finances
  - Public Policy 617: Regulation and the Law
  - Public Policy 619: Governance, Institutions and Public Policy
  - Public Policy 621: Communicating Policy
  - Public Policy 623: Capstone Project
- **d)** Two elective courses:
  - The elective courses must be selected from graduate-level courses offered at the University of Calgary. In selecting electives students need to be aware that they must satisfy the prerequisites for those courses. The two elective courses should be related in such a way that they form a concentration in an area of public policy. See “Approved Graduate Elective Courses” below for suggested electives. The choice of elective courses must in all cases be approved by the Academic Director.

### 6. Additional Requirements

**None.**

### 7. Credit for Undergraduate Courses

The School does not give graduate credit for courses taken below the 600-level, except in special cases.

### 8. Time Limit

Maximum completion time for the MPP is four years.

### 9. Supervisory Assignments

**Master of Public Policy**

All students in the program will be guided by faculty holding appointments to the School.

### 10. Required Examinations

No additional examinations outside of the courses are required.

### 11. Research Proposal Requirements

No additional research requirements outside of the courses are required.

### 12. Special Registration Information

None.

### 13. Financial Assistance

Students admitted to the program will be eligible for financial aid from the University of Calgary. In selecting electives students need to be aware that they must satisfy the prerequisites for those courses. The two elective courses should be related in such a way that they form a concentration in an area of public policy. See “Approved Graduate Elective Courses” below for suggested electives. The choice of elective courses must in all cases be approved by the Academic Director.

### Courses offered by the Department of Economics

- Economics 619: Economics of International Commercial Policy
- Economics 621: International Trade
- Economics 625: The Economics of the Petroleum Industry
- Economics 627: Energy in the Production Sector of the Economy
- Economics 635: Regulatory Economics
- Economics 653: Public Revenue Analysis
- Economics 655: Cost/Benefit Analysis
- Economics 667: Seminar in Industrial Organization
- Economics 675: Advanced Topics in Natural Resource Economics
- Economics 677: Seminar in Economics of the Environment
- Economics 679: Health Economics I
- Economics 681: Health Economics II

### Courses offered by the Department of Political Science

- Political Science 617: Advanced Political Theory
- Political Science 619: War and Interpretation
- Political Science 631: Parties Elections and Representation
- Political Science 641: Selected Topics in Public Law
- Political Science 651: Policy Studies
- Political Science 653: Gender and Public Policy
- Political Science 683: Advanced Studies in Foreign Policy
- Political Science 685: Strategic Studies
- Political Science 689: Unconventional Warfare

### Courses offered by the Department of Sociology

- Sociology 603: Seminar in Sociology of Health and Illness
- Sociology 653: Seminar on Urban Sociology
- Sociology 665: Seminar on Social Stratification and Inequality
- Sociology 667: Seminar on Ethnic Relations
- Sociology 671: Seminar on the Sociology of Families
- Sociology 677: Seminar in Sociology of Gender Relations

### Courses offered by the Faculty of Social Work

- Social Work 632: Social Policy and Social Justice
- Social Work 665: Policy
Program Descriptions

Social Work 679: Special Topics Seminar
(Interested students should contact the Faculty of Social Work for a list of topics to be examined)

Courses offered by the Faculty of Law
Law 648: Securities Law
Law 577: Tax Policy
Law 630: International Petroleum Transactions
Law 624: Environmental Law and Ethics

Courses offered by Haskayne School of Business
Human Resources and Organizational Dynamics 601: Managing Human Resources
Human Resources and Organizational Dynamics 691: Project Team Building and Interpersonal Skills
Human Resources and Organizational Dynamics 721: Advanced Leadership and Technical Skills
Human Resources and Organizational Dynamics 745: Cross Cultural Leadership and Human Resources Management
Strategy and Global Management 701: Strategic Management

Courses offered by Faculty of Medicine, Department of Community Health Sciences
Community Health Sciences 661: Health Economics
Medical Science 659.06: Decision Analysis in Health Care Economics

Religious Studies RELS
Contact Information
Location: Social Sciences Building, Room 1301
Faculty number: 403.220.6988
Fax: 403.210.0801
E-mail address: rels@ucalgary.ca
Web page URL: http://www.ucalgary.ca/rels/

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based

The three study streams at the graduate level are Eastern Religions, Nature of Religion, and Western Religions. Feasibility of programs within these streams depends on available research resources and faculty expertise.

Research is supported in the following areas:
Eastern Religions – Buddhist Studies; East Asian Religions; Chinese Philosophy; Hinduism; Indian philosophy; South Asian Religions
Nature of Religion – Comparative religion; comparative philosophy and religion; religious pluralism; science and religion; women and religion; religion and film; religion and place studies; African religions; new religious movements; hermeneutics; theory and method in the study of religion
Western Religions – Ancient Israel; Biblical mythology; Second Temple Judaism; Rabbinic Judaism; Jewish philosophy; Christian origins and early Christianity; women in early Christianity; early modern Protestantism (Anabaptism, German Pietism, Protestantism and Enlightenment); Christian spiritual autobiography

2. Admission Requirements
In addition to the Faculties of Graduate Studies and Arts requirements, the Department requires:
Master of Arts
a) An admission grade point average of 3.30 or higher on a four-point scale and a minimum of six full-course equivalents in Religious Studies (or their equivalents), usually including at least one full-course equivalent from each of the three streams (Eastern, Western, Nature), as determined by the graduate committee
b) A reading knowledge of a modern language other than English or of a classical language appropriate to the thesis research. The language requirement normally should be met before admission to the Master’s program
c) Two reference letters

Doctor of Philosophy
a) A degree comparable to the University of Calgary Religious Studies Master of Arts with a minimum grade point average of 3.50 on a four-point scale
b) Two reference letters

Students with an Honours Bachelor of Arts degree in Religious Studies, a grade point average of 3.70 or higher, and evidence of competence in the required languages may be admitted directly into the doctoral program or may be considered for transfer to the doctoral program after the first year of the Master’s program. Such applicants must include in their application package a substantial piece of written work and a detailed statement (10 pages) of the purpose, field, and course of study to be pursued in the program.

3. Application Deadline
Deadline for the submission of complete applications is January 7 for September admission.

4. Advanced Credit
Applicants must make advanced credit requests when applying for admission. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission. Graduate course work completed before admission and not counted toward satisfying undergraduate degree requirements will be assessed by the Departmental Graduate Committee to determine course requirements.

5. Program/Course Requirements
Note: The Departmental Graduate Committee will determine the exact number and kinds of courses in each student’s program. In addition to Faculties of Graduate Studies and Arts requirements, the Department normally requires:

Master of Arts (thesis-based)
a) Five half-course equivalents in addition to individualized requirements set by the Departmental Graduate Committee at the time of admission. These will normally consist of:
- Religious Studies 601 – Studies in Western Religions
- Religious Studies 603 – Studies in Eastern Religions
- Religious Studies 605 – Studies in the Nature of Religion
- Religious Studies 607 – Supervised Master’s Thesis Inquiry
- Religious Studies 609 – Critical Discourses in the Study of Religion
b) A thesis proposal to be presented to the Graduate Studies Committee for evaluation and approval before the second annual registration.

Doctor of Philosophy
a) For students with a Master of Arts in Religious Studies, five half courses are required in addition to individualized requirements set by the Departmental Graduate Committee at the time of admission:
- Religious Studies 701 – Studies in Western Religions
- Religious Studies 703 – Studies in Eastern Religions
- Religious Studies 705 – Studies in the Nature of Religion
- Religious Studies 707 – Topics in the Study of Religion
- Religious Studies 709 – Advanced Critical Discourses in the Study of Religion
b) For students transferring from the Master’s program, eight half courses are required in addition to individualized requirements set by the Departmental Graduate Committee at the time of admission:
- Religious Studies 601 – Studies in Western Religions
- Religious Studies 603 – Studies in Eastern Religions
- Religious Studies 605 – Studies in the Nature of Religion
- Religious Studies 701 – Studies in Western Religions
- Religious Studies 703 – Studies in Eastern Religions
- Religious Studies 705 – Studies in the Nature of Religion
- Religious Studies 707 – Topics in the Study of Religion
- Religious Studies 709 – Advanced Critical Discourses in the Study of Religion
6. Additional Requirements

PhD Language Requirements
Before the written candidacy examination, doctoral students must demonstrate a reading knowledge of at least two languages other than English. At the discretion of the Department and upon recommendation of the Graduate Director, competency in additional languages may be required. The foreign language requirement may be satisfied in two ways:

a) Successful completion (final grade of “B” or higher) at some stage of the student’s university program of at least two full-course equivalents in a first language other than English, and one full-course equivalent in a second language; or

b) Successful completion (grade of “B” or higher) of a language examination administered by the Department of Religious Studies or by another department on behalf of the Department of Religious Studies. When the test is administered by another department, it will consist of a passage or passages selected by the supervisor and/or any requirements that the other department may deem necessary; the test will be graded by the examiner(s) of the other department. When members of the Department of Religious Studies administer the test, the examination questions will be determined, administered, and graded by two members of the Department (one of whom normally will be the supervisor) who have expertise in the language under consideration. In the event that a second person with expertise in the required language is not available, the Department Head may seek an expert from outside the department.

7. Credit for Undergraduate Courses
Credit for undergraduate courses will be given only upon approval of the Departmental Graduate Committee.

8. Time Limit
Expected completion time for full-time students is two years in the Master’s program and four years in the PhD program. Maximum completion time is four years in the Master’s program and six years in the doctoral program.

9. Supervisory Assignments
The Departmental Graduate Committee makes interim supervisory assignments when applicants are recommended for admission to the Faculty of Graduate Studies. A regular supervisor must be assigned by the beginning of the second registration year.

10. Required Examinations
The doctoral candidacy examination includes two written components and one oral component. Each written candidacy examination focuses on one aspect of the student’s doctoral research in Religious Studies.

Examination A – theory and method in the study of religion
Examination B – religious beliefs and practices in context

The written examinations are based on a bibliography established by the candidate in consultation with the supervisory committee and must be taken no later than 26 months after admission to the program. The oral examination is based on the bibliography, the written examinations. Questions on the research proposal will not be included in the oral candidacy examination.

Final thesis oral examinations are open.

11. Research Proposal Requirements
The thesis proposal must be approved by each member of the student’s supervisory committee, acknowledged by individual signature and date on the front cover, and by the Departmental Graduate Committee, no later than 24 months after admission to the program with a completed Master’s degree. The proposal should be no more than 20 pages in length and must obtain all required approvals before the student is allowed to take the candidacy examination.

An approved thesis proposal is the basis of consensus on a candidate’s research program. When, as sometimes happens in the course of a research project, the research focus or methodology shifts markedly:

a) The candidate shall forward a letter to the supervisory committee to document the shift and the reason for the shift. The student also shall compose an addendum, to be appended to the initial proposal, detailing the new direction and supplying any necessary additions to the bibliography.

b) The supervisor, on behalf of the supervisory committee, will reply to the revised proposal indicating acceptability and/or required revisions.

Students should be aware that such shifts may entail revision of the supervisory committee structure.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar or inquire of the Department.

Students applying for scholarships must submit their applications to the Department by February 1.

14. Other Information
None.

15. Faculty Members/Research Interests
Current faculty research areas can be found at http://reis.ucalgary.ca/research/interests.

Social Work SOWK

Contact Information
Locations
Calgary:
Professional Faculties Building, Room 3270
Faculty number: 403.220.6945
Fax: 403.282.7269
E-mail address: fswgrad@ucalgary.ca

Edmonton:
#444, 11044-82 Avenue
Faculty number: 780.492.3888
Fax: 780.492.5774
E-mail address: eefleck@ucalgary.ca

Lethbridge:
4401 University Drive
Faculty number: 403.329.2794
Fax: 403.329.2787
E-mail address: aiken@uleth.ca

1. Degrees and Specializations Offered

Doctor of Philosophy (PhD)
MBA/MSW (full-time; course-based)
Post-Master’s Diploma in Advanced Studies in Social Work (PMSW)
Post-baccalaureate Certificate and Diploma in Mental Health and Addictions
Master of Social Work (MSW), course-based (full-time and part-time) and thesis-based; programs available for both BSW graduates and graduates from other disciplines.

PhD
The PhD is a research-based degree and is intended to produce highly qualified social work researchers and teachers. The aim of developing such advanced scholarly and research skills is to equip doctoral students for future roles as leaders of the social work profession. Students complete 9 courses, a candidacy exam, and a thesis.

The Faculty of Social Work also offers a Post-Master’s Diploma in Advanced Studies in Social Work (PMSW). For information on the Post-Master’s Diploma in Advanced Studies in Social Work, contact fswgrad@ucalgary.ca in the Faculty of Social Work.

MSW/MBA
The Faculty of Social Work and the Has- kayne School of Business offer a combined program leading to the Master of Social Work/Master of Business Administration (MSW/MBA) degree.

MSW
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 are required to choose a course-based or thesis route to the degree. The course-based route is appropriate for students who intend to provide direct service in the field. The thesis route is appropriate for students who intend to proceed to doctoral studies and/or anticipate a career requiring...
advanced program evaluation or research skills.

In Calgary, MSW students are admitted annually and choose one of three Specializations: Clinical Social Work Practice, Leadership in the Human Services, or International and Community Development. Students without an undergraduate degree in social work are admitted to a two-year program, while BSW graduates are admitted directly into a one-year Specialization program.

Also offered from the Calgary location, the Master of Social Work/Master of Business Administration (MSW/MBA) program is designed to prepare students for business-related social work careers. This program is available only to full-time MSW Specialization students.

In Edmonton, the Faculty of Social Work offers the Clinical Social Work Practice Specialization. Program delivery blends on-site and web-based formats. On-site courses are offered on Friday evenings and Saturdays, four times per term, and one semester week-long intensives, allowing students from Edmonton and central and northern Alberta to continue working while pursuing graduate education. Students with a BSW complete the Clinical Specialization program in 2 years. Students with an undergraduate degree in other disciplines complete a Foundation program followed by the Clinical Specialization program, requiring a total of 4 years of study. Admission occurs in odd-numbered years (i.e., 2011, 2013, etc.).

In Lethbridge, the Faculty of Social Work offers the Clinical Social Work Practice Specialization to students with a BSW. Program delivery blends web-based and on-site formats, allowing students from Lethbridge and southern Alberta to continue working, while pursuing graduate education. Students complete the program in 2 years. Admission occurs in odd-numbered years (i.e., 2011, 2013, etc.).

The MSW course-based Specialization in Leadership in the Human Services is administered through Calgary as a distance program and is accessible to students regardless of home location. Please consult the Faculty of Social Work website: http://fsw.ucalgary.ca/. One course is offered on campus for one week in July in both the first and second years of the program. Other courses are offered via distance delivery. The program is designed to be completed in two years of full-time study. For information, consult the website or contact the Student Services Office in the Faculty of Social Work.

2. Admission Requirements

Students are responsible for meeting the admission requirements as established by the Faculty of Graduate Studies. In addition to Faculty of Graduate Studies requirements, the Faculty of Social Work requires the following:

For PhD:

a) A Master of Social Work or equivalent graduate degree with a minimum grade point average of 3.50 on a four-point scale;
b) A study plan outlining the applicant’s educational goals, career expectations, and research interests;
c) Substantial professional experience;
d) Samples of written work including, for example, published and/or unpublished scholarly papers and/or professional reports; and
e) Two reference letters.

For MSW course-based:

In Calgary and Edmonton,

a) A Bachelor of Social Work degree, or a four-year Bachelor’s degree from another discipline;
b) The equivalent of two years of full-time paid or volunteer work in the human services field;
c) A study plan outlining the applicant’s educational goals and career expectations. (If applying to the Calgary program, the study plan must indicate the applicant’s intended area of specialization: Clinical Social Work Practice, Leadership in the Human Services, or International and Community Development.); and
d) Two reference letters.

In Lethbridge,

a) A Bachelor of Social Work degree;
b) A study plan outlining the applicant’s educational goals and career expectations; and
c) Two reference letters.

For MSW thesis-based,

In Calgary and Edmonton,

a) A Bachelor of Social Work degree, or a four-year Bachelor’s degree from another discipline;
b) The equivalent of two years of full-time paid or volunteer work in the human services field;
c) A study plan outlining the applicant’s educational goals and career expectations. (If applying to the Calgary program, the study plan must indicate the applicant’s intended area of specialization: Clinical Social Work Practice, Leadership in the Human Services, or International and Community Development.); and
d) An additional statement providing a rationale for selecting the thesis route and describing the applicant’s area of research interest. Students considering applying to the thesis route are strongly encouraged to discuss this option with a Faculty member prior to completing the application process; and
e) Two reference letters.

3. Application Deadline

Final submission deadlines are as follows:

PhD Program: January 31 for September admission (in exceptional cases, applicants may be accepted for alternative admission dates).

Calgary MSW Programs: December 1 for: September admission to the Clinical Social Work Practice and International and Community Development Specializations. July admission to the Leadership in Human Services Specialization (distance delivery), and/or July or September admission to MSW/MBA (depending upon Specialization). The Calgary MSW Program uses a rolling admission policy; that is, qualified applicants may be offered a space in a program prior to final application submission deadlines.

Edmonton and Lethbridge MSW Programs: January 31 for September admission in odd-numbered years (2011, 2013, etc.).

4. Advanced Credit

The applicant must make advanced credit requests as part of the admission process. Credit will not be given for coursework taken as part of another completed degree/diploma or for courses taken to raise the grade point average for admission purposes. For all Faculty of Social Work graduate programs, advanced credit may be granted for not more than the equivalent of three half courses.

Approval of advanced credit will be based on an evaluation of the student applicant’s particular circumstances and the fit between the prior coursework and the applicant’s program of study in the MSW. Students exploring the possibility of Advanced Credit should contact the Student Advisor in the program location to which they are applying (Calgary, Edmonton, or Lethbridge).
5. Program/Course Requirements

Please note that not all programs/courses are offered every semester. Students should consult the timetables and program curriculum plans located on the web for sequences and availability of courses.

In addition to Faculty of Graduate Studies requirements, the Faculty of Social Work requires:

**MSW for students with a BSW:**

Course-based students complete ten Specialization half-course equivalents as follows:

a) 5 core courses (see specific courses listed by Specialization, below);

b) 3 option courses (option course requirements and offerings vary by year, program and location); and

c) Social Work 696: Advanced Practicum (525 hours; one full course).

Thesis-based students complete nine Specialization half-course equivalents as follows:

a) 5 core courses (see specific courses listed by Specialization, below);

b) Social Work 655 Thesis Research;

c) 1 option course (option course requirements vary by year, program and location); and

d) Social Work 696 Advanced Practicum (one full course; in order to accommodate thesis requirements, students in the thesis route may complete a minimum of 300 hours).

Clinical Social Work Practice Specialization (offered in Calgary, Edmonton and Lethbridge)

Required core courses:

- Social Work 651: Policy as Context for Clinical Work
- Social Work 653: Comparative Approaches to Change
- Social Work 657: Clinical Social Work Applications
- Social Work 659: Evidence and Clinical Practice
- Social Work 696: Advanced Practicum (525 hours; one full course)
- Social Work 697: Diversity, Oppression, and Social Justice

Leadership in the Human Services (LHS) Specialization (distance delivery; offered in Calgary only)

Required core courses:

- Social Work 665: Influencing Social Policy
- Social Work 667: Leadership Theories In Action
- Social Work 669: Leading Organizations and Communities
- Social Work 693: Research as a Foundation for Leadership
- Social Work 697: Diversity, Oppression, and Social Justice
- Social Work 696: Practicum (525 hours; one full course)

In the LHS Specialization, option courses are predetermined, as follows:

- Social Work 695: Becoming an Evidence-Based Leader
- Social Work 679.10: Maximizing Staff Performance through Supervision
- Social Work 679.18: Practice Skills for Leading and Supervising in Human Services Organizations

International and Community Development (offered in Calgary only)

Required core courses:

- Social Work 671: Social Policy
- Social Work 677: Social Work Research for International and Community Methods
- Social Work 697: Diversity, Oppression, and Social Justice
- Social Work 697: Oppression and Social Justice
- Social Work 696: Advanced Practicum (525 hours, usually completed outside of Canada in the Spring/Summer semester following completion of core courses; one full course).

**MSW/MBA**

A minimum of eight half-course equivalents in the MSW Specialization year required (5 core specialization courses, 1 option, and Social Work 696 for 525 hours—one full course), and a minimum of sixteen half-course equivalents in the MBA program.

Required MBA half courses include:

- Accounting 601: Financial Accounting
- Accounting 603: Management Accounting
- Finance 601: Managerial Finance
- Human Resources and Organizational Dynamics 601: Managing Human Resources
- Marketing 601: Marketing Management
- Management Information Systems 601: Management Information Systems
- Management Studies 611: Managerial Economics
- Management Studies 613: Managerial Decision Modeling
- Management Studies 715: Strategic Business Analysis
- Operations Management 601: Operations Management
- Strategic and Global Management 601: Strategic Management I
- Business and Environment 777: Global Environment of Business
- Management Studies 790: Seminar (one quarter course)
- Management Studies 789.02: Leadership Capstone (one quarter course)
- and 3 elective courses in the student’s area of interest.

**PhD**

A minimum of nine half-course equivalents;

Required core courses include:

- Social Work 741: Research Foundations: Epistemology and Professional Knowledge-Building
- Social Work 745: Research Methods I: Quantitative
- Social Work 747: Research Methods II: Qualitative
- Social Work 721: Integrative Research Colloquia
Program Descriptions

Note: Social Work 721 can only be taken once all other required courses have been completed. Equivalent courses may be taken outside the Faculty with the approval of the Faculty of Social Work.

Four half course options relevant to the student's area of specialization. Option courses may be taken outside of the Faculty of Social Work, depending on the student's needs and course availability. All courses taken external to the Faculty of Social Work must have prior approval from the Faculty of Social Work.

A thesis research proposal.

MHA Certificate
Total of four courses: Three core courses (IPHE601, IPHE603, IPHE605) plus one option

MHA Diploma
Total of eight courses: Completion of the Certificate, plus one core (IPHE607), two additional options, and a practicum (130 hours)

6. Additional Requirements
Participation in Orientation Sessions held prior to the start of the Fall semester is strongly recommended for incoming students.

7. Credit for Undergraduate Courses
Credit for undergraduate courses will not be awarded.

8. Time Limit
As established by the Faculty of Graduate Studies, maximum completion time is four years for a thesis-based master's program, six years for a doctoral program or a course-based master's, and seven years for the MSW/ MBA Program.

Expected completion times in the Calgary programs are:
- One 12-month year for full-time course-based MSW students with a BSW
- Two 12-month years for full-time course-based MSW students without a BSW
- Two 12-month years for a thesis-based MSW
- Six 12-month years for a PhD
- Four 12-month years for a part-time MSW without a BSW

In the Edmonton and Lethbridge MSW programs, students are admitted as cohorts and are therefore required to complete courses as they are scheduled.

In Edmonton, course-based students admitted without a BSW complete the Foundation program component in the initial 2 years and the Clinical Specialization component in the subsequent 2 years.

In Edmonton and Lethbridge, course-based students admitted with a BSW complete the MSW Clinical Specialization in 2 years. Typically, thesis students require one additional 12-month year to complete their programs.

Courses are scheduled on weekends, in week-long intensives and/or in on-line format for accessibility by rural and employed students. For the purposes of government grants and loans, students are classified as full-time.

Maximum completion time for the MHA Certificate and Diploma is four (4) Years.

9. Supervisory Assignments
Course-based MSW and MSW/ MBA students are assigned a faculty advisor upon entry into the program. A change of advisor, initiated by the student or the faculty member, can occur at any time during the student's enrollment in the program.

PhD, PMD and thesis-based MSW students are initially assigned an interim faculty advisor. Before the end of the first year, each student must designate a faculty member as permanent supervisor. In the doctoral program, the supervisor and student must then select a supervisory committee within three months of the appointment of the permanent supervisor. Supervisory committees typically consist of the supervisor and two other members, one of whom may be external to the Faculty of Social Work.

10. Required Examinations
PhD
The doctoral candidacy examinations are taken within 28 months of the student's admission to the program and after all required course work has been completed. The examinations include a written and an oral component, both of which the student must complete to the satisfaction of his or her examining committee. Students must similarly defend their dissertation to the satisfaction of the examining committee. Students should consult the FSW candidacy examination guidelines for further detail.

MSW (thesis)
The final examination for the thesis-based MSW involves an oral defence of the thesis. The thesis examination is conducted by the student's examining committee, which must be designated at least one month before the oral examination.

MSW (course-based)
Course based students are required to complete a capstone experience at the end of their coursework and practicum. Each student will meet this requirement according to the structure within his/her location (Calgary, Edmonton, Lethbridge).

11. Research Proposal Requirements
MSW (thesis) and PhD students whose research involves human subjects must receive approval from the University of Calgary Conjoint Faculties Research Ethics Board before beginning data collection. A copy of the proposal becomes part of the student’s record within the Faculty of Social Work.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this calendar (http://fsw.ucalgary.ca/Gradstfund), and consult with the Student Services Office in the Faculty of Social Work.

14. Other Information
All students in the Faculty of Social Work are expected to be proficient in and have access to email, Internet searching, and word processing computer programs. Students may be expected to use technology in courses; video-conferencing, web-based tools, discussion boards, and chat rooms may be used in addition to or in lieu of class time.

The Master of Social Work program is accredited by the Canadian Association of Social Work Education. Information on the Faculty of Social Work and its programs is available on-line at http://www.fsw.ucalgary.ca.

Requests for information should be directed as follows:
Calgary: 1-877-220-6945
Edmonton: 1-888-492-2083
Lethbridge: 1-866-329-2794

15. Faculty Members/Research Interests
Current faculty members and their research interests can be found at http://fsw.ucalgary.ca/.

16. Interprofessional Practice in Health Care
The Faculties and Departments of Medicine, Social Work, Nursing, Community Rehabilitation and Disability Studies, Psychology and Education, along with Alberta Health Services, jointly sponsor courses in Interprofessional Practice in Health Care (IPHE). The courses provide the foundation for sound and evidence-informed interprofessional practice in the fields of health and mental health and addictions where co-morbidity is common. IPHE 601 and 603 can be credited as 600-level Social Work options.
Sociology SOCI

Contact Information
Location: Social Sciences Building, Room 956
Faculty number: 403.220.6501
Fax: 403.282.9298
E-mail address: vhansen@ucalgary.ca
Web page URL: http://soci.ucalgary.ca/

1. Degrees and Specializations
Offered
Doctor of Philosophy (PhD)
Master of Arts (MA), thesis-based

2. Admission Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts
a) A grade point average of 3.30 on a four-point scale over the last two years of coursework or 10 full-course equivalents
b) Demonstrated competence, normally through course work, in classical and contemporary theory, research methods, and statistics
c) A written statement of intent
d) A sample of written work
e) Two reference letters

Doctor of Philosophy
a) A grade point average of 3.50 on a four-point scale over a Master's program
b) Demonstrated competence in theory, methodology, and statistics, in addition to a substantive interest
c) A written statement of intent
d) A sample of written work
e) Two reference letters

3. Application Deadline
Deadlines for the submission of complete applications:
February 1 for September admission

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

Master of Arts – Credit may be allowed for up to two 600-level Sociology half courses.
Doctor of Philosophy – Credit may be allowed for up to three 600- or 700-level half courses.

5. Program/Course Requirements
In addition to Faculties of Graduate Studies and Arts requirements, the Department requires:

Master of Arts
a) Competence in sociological statistics, methods of sociological research, and sociological theory demonstrated by completing Sociology 611; 613 or 615; and 631.
b) Completion of two half-course equivalent electives at the 600 or 700 level; at least one half-course equivalent elective must be a Sociology Department offering in a substantive area.
c) Completion of Sociology 602 - Training in Professional Sociology and successful preparation and completion of a thesis prospectus.

Doctor of Philosophy
a) Sociology 611; 702; 731; two half-course equivalent methodology courses at the 700 level, selected from decentralized sections of Sociology 705Q, 711Q, or 715Q; two half-course equivalent electives at the 600 or 700 level selected from Sociology Department offerings on substantive topics. Students who have taken one of the required courses in a previous degree may substitute any other 600- or 700-level course.
b) Successful completion of a thesis prospectus, normally within twenty months of initial registration in the doctoral program. Successful completion of the prospectus means that the Supervisory Committee has approved the thesis project, and a written copy of the prospectus is filed with the Sociology Department Student Administrator.
c) A candidacy examination with a written and oral component.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
None.

8. Time Limit
Expected completion time is 20-24 months for the Master of Arts and four years for the Doctor of Philosophy degree. Maximum completion time is four years for the Master of Arts and six years for the doctoral program.

9. Supervisory Assignments
An interim advisor is assigned to incoming students who have not already selected a supervisor. After two terms in the program, a student will make supervisory arrangements with a faculty member in the chosen area of research. In the case of doctoral students, the supervisor and student will select two other faculty members to serve on the student’s supervisory committee.

10. Required Examinations
Candidacy Examinations
The candidacy examination has a written and an oral component. A final reading list is prepared by the student’s supervisory committee and given to the student at least three months before the written examination. The written candidacy examination in the student’s substantive area is written within one month of the oral candidacy examination. The written candidacy is normally a seven-day take-home or seven-hour closed-book examination. Both the written and oral candidacy examinations are graded together.

Questions on the research proposal will not be included in the oral candidacy examination.

Thesis Oral Examinations
Final thesis oral examinations are open.

11. Research Proposal Requirements
Students whose research involves human subjects must receive approval from the departmental Ethics Review Committee and the University of Calgary Conjoint Faculties Research Ethics Board before beginning data collection.

Master of Arts students are required to prepare a thesis prospectus.

Doctoral students are required to prepare a thesis prospectus for approval by their supervisory committee within twenty months of the date of entry into the program.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. Information on departmental funding is available in the on-line Graduate Student Handbook at http://soci.ucalgary.ca/graduate. For further information on awards, please see the Awards and Financial Assistance section of this Calendar.

Students applying for Open Scholarships through the Faculty of Graduate Studies must submit their applications to the Department by January 15.

14. Other Information
Students should refer to the Department’s on-line information and the Sociology Graduate Student Handbook at http://soci.ucalgary.ca/graduate for further clarification and explanation of these regulations.

15. Faculty Members/Research Interests
The active research interests of the faculty can be found at http://soci.ucalgary.ca/people/faculty.
Sustainable Energy Development SEDV

Contact Information
Location: Haskayne School of Business, Room 453
Faculty number: 403.220.2013
Fax: 403.282.0095
E-mail address: CALGARY: sed@ucalgary.ca
QUITO: sed@usfq.edu.ec
Web pages URL: http://www.ucalgary.ca/sustainableenergy/ and http://www.usfq.edu.ec/

1. Degrees and Specializations Offered
Master of Science (MSc) with a specialization in Sustainable Energy Development, course-based
Part-time status is available.
The Master of Science in Sustainable Energy Development Program is an interdisciplinary program for professional individuals seeking a broad-based education in energy and sustainable development.
Instruction is offered by members of the Faculties of Environmental Design, Law, the Schulich School of Engineering and the Haskayne School of Business of the University of Calgary and from the Universidad San Francisco de Quito.
The Program is for high potential professionals who have demonstrated the ability to produce results, communicate effectively, and who have an interest in sustainable development. They will have an undergraduate degree from an internationally recognized university in any discipline (engineering, management, law, architecture, etc.) and preferably three years of work experience. Students enter with a broad range of educational and experience backgrounds, many from energy and environment organizations, including government agencies.
The objective of the Program is to provide students with a background in energy/environmental management such that they will be able to ensure sustainable energy development and minimize the impact of development on the environment.
CALGARY, Alberta, Canada: The program is offered at the University of Calgary campus over a period of 16 months beginning in May of each year.
QUITO, Ecuador, South America: In partnership with the Universidad San Francisco de Quito (USFQ) and the Latin American Energy Organization (OLADE), the program is offered at USFQ campus over a period of 16 months beginning in August of each year.

2. Admission Requirements
In addition to Faculty of Graduate Studies and Haskayne School of Business requirements, the Program requires:
a) Letter of intent outlining background, research interest and goal for the Program.
b) In exceptional circumstances, students who do not meet the Faculty of Graduate Studies minimum GPA requirement of 3.00 may be considered for admission after upgrading requirements have been met. These include a minimum of 3 make-up half courses with a minimum grade of "B" in each course. The make-up courses must be senior undergraduate level courses or higher. Relevant work experience will be considered.
c) Curriculum Vitae.
d) Work experience (to be assessed by the Program director).
e) Certificate of proficiency in the English language or TOEFL, IELTS, MELAB or PTE (refer to the Admissions section of this calendar for minimum English language proficiency score requirements).
f) Two reference letters.

3. Application Deadline
CALGARY:
Canadian Residents: March 31 for May admission
International Students: December 31 for May admission
QUITO:
Residents not requiring a study permit: June 30 for August admission
Canadian/International students: April 30 for August admission

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process.

5. Program/Course Requirements
In addition to the Faculty of Graduate Studies and Haskayne School of Business requirements, the Program requires:
CALGARY and QUITO:
a) Successful completion of 14 graduate-level courses
b) Attendance and participation in seminars, upgrade courses and field trips
c) Attendance and participation in Recapitulation session
QUITO only:
Completion of English upgrading course (2-3 week duration) for non-native English students subject to the discretion of the program directors.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
The Program does not accept undergraduate courses for credit toward the graduate degree.

8. Time Limit
Expected completion time is 16 months. Maximum completion time is six years.

9. Supervisory Assignments
Not applicable.

10. Required Examinations
A final comprehensive oral examination is required upon completion of all course work. The purpose of the examination is to determine the student's ability to integrate and apply all interdisciplinary aspects of the Program. The examination will be based on content from the 14 courses and seminars. All students must successfully complete all course and seminar requirements before the comprehensive examination.

11. Research Proposal Requirements
Please refer to Sustainable Energy Development 625 course requirements.

12. Special Registration Information
Admission to the Program delivered in Calgary is only available in May of each year. Admission to the Program delivered in Quito, Ecuador is only available in August of each year.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

14. Other Information
CALGARY and QUITO:
All courses are instructed in English.
QUITO only:
Students are not required to speak Spanish for admission to the Program at USFQ. However it is strongly recommended that non-native Spanish speakers take the preliminary Spanish upgrade course that is part of the USFQ Program offering.

15. Faculty Members/Research Interests
See the website of the home department and home institution of the Faculty member.

Veterinary Medical Sciences VMS

Contact Information
Location: Teaching Research and Wellness (TRW) Building, Room 2D09
Faculty number: 403.210.6628
Fax: 403.210.8121
E-mail address: vmgrad@ucalgary.ca
Web page URL: http://vet.ucalgary.ca/graduate

1. Degrees and Specializations Offered
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based
*All students are registered full-time.

2. Admission Requirements
In addition to the Faculty of Graduate Studies requirements, the Faculty of Veterinary Medicine requires:
a) A baccalaureate degree ** or its equivalent from a recognized institution with a
minimum admission grade point average of 3.00 on a 4-point scale or equivalent, and a minimum of 3.00 during the last two years (60 credit hours) of undergraduate study;

b) For applicants required to provide proof of proficiency in English, a minimum TOEFL score of 580 (written test), or 92 (internet-based test), a minimum IELTS score of 7.0, or a minimum MELAB score of 82;

c) Two reference letters.

*Note that a Doctor of Veterinary Medicine (DVM) degree is not a requirement for entry into the MSc or PhD programs. Applicants who do not meet the above requirements will be considered only under exceptional circumstances.

3. Application Deadline

Applications will be considered for the September, January, and May terms and will only be reviewed upon submission of online application and receipt of ALL required supporting documents by the following deadlines:

<table>
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<th>Admission Term</th>
<th>Canadian and US Admission Deadline</th>
<th>International Admission Deadline</th>
</tr>
</thead>
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<tr>
<td>September</td>
<td>June 1</td>
<td>March 1</td>
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<tr>
<td>January</td>
<td>November 1</td>
<td>June 1</td>
</tr>
<tr>
<td>May</td>
<td>March 1</td>
<td>November 1</td>
</tr>
</tbody>
</table>

4. Advanced Credit

Advanced credit may be given for course work completed prior to entry into the program. The applicant must make requests for advanced credit as part of his or her application for admission.

5. Program/Course Requirements

In addition to Faculty of Graduate Studies requirements, all MSc and PhD students must complete:

a) Veterinary Medicine 600 - Seminars in Veterinary Medical Sciences.

b) Veterinary Medicine 601 - Professional Skills in Health Science Research.

c) Veterinary Medicine 605 – Introduction to Research Methods.

A suitable entry-level biostatistics course may be taken as an alternative with permission from the Graduate Program Director;

d) MSc students must take at least one additional and PhD students must take at least two additional graduate level half courses appropriate to their field of study and approved by their Supervisory Committee; and

e) Presentation of a final seminar that precedes the thesis defence.

6. Additional Requirements

All Graduate Students will meet with the Graduate Training Manager at least once per year to review their research and scholarly progress. Contributions to the published research literature and presentations at scientific conferences are encouraged.

7. Credit for Undergraduate Courses

The student’s Supervisory Committee may recommend credit for undergraduate courses provided they are relevant to the area of study.

8. Time Limit

Expected completion time for an MSc is two years with a maximum time of four years, for students in full-time study; students in PhD programs are expected to complete in four years but not longer than six years.

9. Supervisory Assignments

Students will normally have identified a permanent supervisor at the time of admission. Alternatively, the VMS Graduate Program has an optional rotation program that may last up to six months. This program will only be available for the September admission term. The rotation program allows each student to sample different research areas and thus to make a highly-educated choice of research topic, supervisor, and their research team. Rotations are 8 weeks in duration during which the student works closely with the supervisor or member of the research team as part of an ongoing study, as well as focusing on their course work. Students will be paid the standard stipend by the Program during the rotation period (prorated from $20,000 per year = $10,000 for six months or less if the student chooses a permanent supervisor early). After the rotation program, the student will select a permanent supervisor and is encouraged to apply for further funding. For further details, please contact vmgrad@ucalgary.ca.

In consultation with their supervisor(s), a Supervisory Committee will be selected which includes a minimum of two additional faculty members (MSc) or three additional faculty members (PhD). In the case of the PhD, one member should come from outside the VMS graduate program. The Graduate Program Director will approve the composition of the committee within three months of appointment of supervisor.

10. Required Examinations

The candidacy exam for VMS PhD students will consist of a written and oral component. The student’s research proposal serves as the basis for the written component of the candidacy exam. In the VMS Graduate Program, the oral part of the exam is based both on the written proposal and all relevant related topics assigned by the exam committee. Therefore, it is required that the candidacy is completed early in the student’s program, at the latest by 18 months. The written component shall consist of maximum 20 page (double-spaced) document, excluding references and figures, and will include a relevant literature summary of the student’s field of study and description of proposed research. The oral exam should be scheduled one week after submission of the written proposal to the exam committee. The supervisor/co-supervisor will attend the exam as non-voting members. The final thesis defence for MSc and PhD degrees will consist of a public seminar followed by an open oral examination.

11. Research Proposal Requirements

The VMS Graduate Program requires all Masters and PhD students to defend a Research Proposal to their supervisory committee. A copy of the final version of the proposal will be kept in the student’s file. For VMS Masters students, this must happen no later than twelve months after initial registration in the program. For VMS PhD students the defense of the proposal is part of the candidacy exam. All components of the candidacy exam must be completed within 18 months of first registration. All Masters students who transfer to a PhD must present and defend a revised proposal to their Supervisory Committee within six months of program transfer as a component of their candidacy exam.

12. Special Registration Information

None.

13. Financial Assistance

Full time graduate students in the VMS Graduate Program will be offered a stipend of at least $20,000 per year (normally two years for MSc and four to five years for PhD students). Funding, secured by the student and or supervisor, may come from a variety of sources, including grants, external salary awards, and UCVM scholarships. Students who hold relevant professional degrees (e.g., DVM, MD) are also eligible to apply for generous post-professional awards of up to $40,000 per year for two years through the UCVM Entrance Awards. Admission to the Program is conditional on demonstration of internal or external studentship support. Although initially required to pay a differential tuition fees, International students registered in the VMS Graduate Program will be reimbursed the full value of their differential fee each year. Further information on funding opportunities can be found at http://vet.ucalgary.ca/awards_amp_scholarships.

14. Other Information

Outstanding students enrolled in the MSc program may request a change of registration status and transfer to the PhD program. The request must be done within the first 18 months of the program and supported in writing by the supervisor and formally recommended by the Supervisory Committee to the Graduate Program Director. The student will be required to defend their thesis proposal, appropriate for a Ph.D project, within six months of transferring to complete the requirements of the PhD candidacy exam.

15. Faculty Members/Research Interests

Faculty members and their research interests may be found at: http://vet.ucalgary.ca/research_areas.

Additional information can be obtained by calling the contact number listed for the VMS program or from the Administrative Office of the Faculty of Graduate Studies.
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.

Course Numbers: e.g. Medical Science 609
The number of the course indicates the level of the course:
• Junior level: 200’s
• Senior level: 300’s and 400’s
• Upper level undergraduate: 500’s
• Graduate level: 600’s and 700’s

Hours of Instruction: e.g. H(3-2T)
The hours of instruction per week are indicated with this code:
• M More than a full course; refer to individual course description for hours.
• F(3-3) Full course; equivalent of 3 hours of lectures and 3 hours of lab each week for 2 terms.
• F(3-15-3) Full course; equivalent of 3 hours of lectures, 1 seminar hour, and 3 hours of lab each week for 2 terms.
• Q(3-0) Quarter-course; equivalent of 3 hours of lectures each week for 1 half term.
• H(3-3/2) Half-course; equivalent of 3 hours of lectures every week and 3 hours of lab every other week for 1 term.
• E(0-3) Eighth-course; equivalent of 3 hours of lab each week for one quarter term.

The figures “S” or “T” attached to a number signify seminar or tutorial hours.

Cross-Listed Courses: e.g. Medical Science 609 (Biochemistry 609)
Courses which are listed under two departments and which can be taken for credit from either department, but not both. The credit is determined by the student’s registration.

Prerequisite: Must be completed before registering in this class.

Corequisite: Must be completed at the same time as this class.

Notes/Antirequisites: Notes provide additional information pertaining to the course, e.g. restrictions, recommendations. Certain courses carry the notation “Not open to students with credit in course number XXX or in Credit for both 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.

May Be Repeated for Credit
Some courses are decimated in order to accommodate different topics of study e.g. 609.01, 609.02. If this notation is present, students are allowed to take multiple decimated topics belonging to one course number.

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

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Kinesiology KNES

Faculty of Law
Law LAW

Faculty of Medicine
Community Health Sciences MDCH
Medical Science MDSC

Faculty of Nursing
Nursing NURS

Schulich School of Engineering
Biomedical Engineering BMEN
Chemical Engineering ENCH
Civil Engineering ENCI
Electrical Engineering ENEL
Environmental Engineering ENEN
Geomatics Engineering ENGO
Manufacturing Engineering ENMF
Mechanical Engineering ENME
Software Engineering for Engineers ENSF

Faculty of Science
Applied Mathematics AMAT
Astronomy ASTR
Astrophysics ASPH
Biochemistry BCEM
Biology BIOL
Botany BOTA
Cellular, Molecular and Microbial Biology CMMB
Chemistry CHEM
Computer Science CPSC
Ecology ECOL
Geology GLGY
Geophysics GOPH
Marine Science MRSC
Medical Physics MDPH
Physics PHYS
Pure Mathematics PMAT
Space Physics SPPH
Statistics STAT

Faculty of Social Work
Social Work SOWK

Faculty of Veterinary Medicine
Veterinary Medicine VETM

Collaborating Faculties
Community Rehabilitation (MD, SW) CORE
Interprofessional Health Education (KN, NU, SW) IPHE
Language (AR, ED) LANG
Software Engineering (EN, SC) SENG
Sustainable Energy Development (EN, EV, LA, HA) SEDV

Other
Energy and Environmental Systems EESS
Public Policy PPOL
University UNIV
## Course Descriptions

### Accounting ACCT

**Instruction offered by members of the Haskayne School of Business.**

**Accounting Chairperson — H. Warsame**

### Graduate Courses

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<th>Title</th>
<th>Prerequisite(s)</th>
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<td>Accounting 603</td>
</tr>
<tr>
<td>Management Accounting</td>
<td>Break even 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.</td>
<td>Accounting 603</td>
</tr>
<tr>
<td>Intermediate Financial Accounting I</td>
<td>Provides detailed 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 such methods and the need for sound professional judgment.</td>
<td>Accounting 601 and 603; or consent of the Haskayne School of Business.</td>
</tr>
<tr>
<td>Intermediate Financial Accounting II</td>
<td>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.</td>
<td>Accounting 601 and 603.</td>
</tr>
<tr>
<td>Cost Accounting</td>
<td>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.</td>
<td>Accounting 603.</td>
</tr>
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<td>Taxation</td>
<td>Accounting 601.</td>
</tr>
<tr>
<td>Advanced Taxation</td>
<td>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.</td>
<td>Accounting 601.</td>
</tr>
</tbody>
</table>

### Undergraduate Courses

**Courses of Instruction**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting 601</td>
<td>Introductory Financial Accounting</td>
<td>Accounting 603</td>
</tr>
<tr>
<td>Management Accounting</td>
<td>Break even 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.</td>
<td>Accounting 603</td>
</tr>
<tr>
<td>Intermediate Financial Accounting I</td>
<td>Provides detailed 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 such methods and the need for sound professional judgment.</td>
<td>Accounting 601 and 603; or consent of the Haskayne School of Business.</td>
</tr>
<tr>
<td>Intermediate Financial Accounting II</td>
<td>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.</td>
<td>Accounting 601 and 603.</td>
</tr>
<tr>
<td>Cost Accounting</td>
<td>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.</td>
<td>Accounting 603.</td>
</tr>
<tr>
<td>Accounting 721</td>
<td>Taxation</td>
<td>Accounting 601.</td>
</tr>
<tr>
<td>Advanced Taxation</td>
<td>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.</td>
<td>Accounting 601.</td>
</tr>
</tbody>
</table>

### PhD Course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
</table>

### Anthropology ANTH

**Instruction offered by members of the Department of Anthropology in the Faculty of Arts.**

**Department Head – M. Pavelka**

### Undergraduate Courses

Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 501</td>
<td>Conference Course in Anthropology</td>
<td>Anthropology 203 or consent of the Department.</td>
</tr>
</tbody>
</table>

### Graduate Courses

Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 505</td>
<td>Conference Course in Primatology</td>
<td>Anthropology 311 and one additional senior primatology course and consent of the Department.</td>
</tr>
</tbody>
</table>

### 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 on the study of human and non-human primates. Consent of the Department. Not open to students with credit in Anthropology 609, Archaeology 609, and Geography 609.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 535</td>
<td>History and Theory in Primatology and Physical Anthropology</td>
<td>Anthropology 311 plus one of the following: Anthropology 413, 435 or 451.</td>
</tr>
</tbody>
</table>

### 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. Consent of the Department.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 541</td>
<td>Field Study in Social and Cultural Anthropology</td>
<td>Anthropology 351 and consent of the Department.</td>
</tr>
</tbody>
</table>

### Field Studies in Primatology

Intensive training and practice in field methods of observational primate behaviour or behavioural ecology. Consent of the Department.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 552</td>
<td>Field Studies in Primatology</td>
<td>Anthropology 553 or consent of the Department.</td>
</tr>
</tbody>
</table>

**Note:** Normally offered during Spring Term.
### Courses of Instruction

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 553</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td><strong>Primate Behavioural Research Design</strong></td>
<td>Design of a research project, including the identification and operationalization of a research question and the collection and analysis of data.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Anthropology 552 and consent of the Department.</td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>Normally offered during Spring Term.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology 571</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Seminar in Primatology</strong></td>
<td>Current theoretical and methodological issues will be explored in a discussion based seminar format.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Anthropology 413 and consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 573</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Seminar in Social and Cultural Anthropology</strong></td>
<td>Current theoretical and methodological issues will be explored in a discussion based seminar format, with the possibility of development of a research project.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Anthropology 411 and consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 589</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>(Archaeology 589)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nutritional Anthropology</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Anthropology 201 or Archaeology 203 or Archaeology 305, and consent of the Department.</td>
<td></td>
</tr>
</tbody>
</table>

### Graduate Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology 601</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Conference Course in Anthropology</strong></td>
<td>A specialized area of Anthropology selected on the basis of particular interest and need.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology 603</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Thesis Development</strong></td>
<td>A reading and conference course in the student’s substantive area conducted jointly by at least two faculty members.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology 605</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Professional Skills for Anthropologists</strong></td>
<td>Training and practice in research/teaching skills; grantsmanship, conference and classroom presentations, academic publishing, job interviews.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td><strong>Antirequisite(s):</strong></td>
<td>Not open to students with credit in Anthropology 601.90 or the equivalent.</td>
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<tr>
<td><strong>NOT INCLUDED IN GPA</strong></td>
<td></td>
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</tr>
<tr>
<td>Anthropology 611</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Methods in Anthropological Research</strong></td>
<td>A variety of topics relevant to research and the logic of inquiry in Anthropology.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 613</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Current Issues in Methodology in Primatology</strong></td>
<td>A variety of topics relating to aspects of data collection and data analysis in primatology, with a focus on ecological and behavioural data.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 631</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Anthropological Theory</strong></td>
<td>Seminar dealing with the theoretical material of primatological and biobehavioural perspectives in Anthropology.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 635</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Primatological Theory</strong></td>
<td>Seminar dealing with the theoretical material of primatological and biobehavioural perspectives in Anthropology.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 641</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Seminar in Civil-Military Relations</strong></td>
<td>Comparative analysis of relations between civil society and military institutions. While most theories of civil-military relations take the military and civilian sectors as a given, this seminar will adopt a critical approach to analyzing how civil and military institutions mutually constitute each other as distinct forms of society.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Anthropology 659</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td><strong>Primatology</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology 701</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Department.</td>
<td></td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</tr>
</tbody>
</table>

### Applied Mathematics AMAT

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Mathematics 503</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>The Mathematics of Wavelets, Signal and Image Processing</strong></td>
<td>Continuous and discrete Fourier transforms, the Fast Fourier Transform, wavelet transforms, multi-resolution analysis and orthogonal wavelet bases, and applications.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Applied Mathematics 491 or Computer Science 491.</td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics 505</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Calculus on Manifolds</strong></td>
<td>Integral and differential calculus on manifolds including tensor fields, covariant differentiation, Lie differentiation, differential forms, Frobenius’ theorem, Stokes’ theorem, flows of vector fields.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Pure Mathematics 445 or 545; and one of Applied Mathematics 311 or 307; or consent of the Division.</td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics 507</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Applied Mathematics 505 or consent of the Division.</td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics 509</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Analytical Dynamics</strong></td>
<td>Symplectic geometry, Hamilton’s equation, Hamilton-Jacobi theory, constraints and reduction.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Applied Mathematics 505 or consent of the Division.</td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics 581</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Futures and Options</strong></td>
<td>Stochastic calculus and the dynamics of asset prices, martingale theory and risk-neutral valuation, interest rate models, energy and commodity markets, value-at-risk and risk management.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Applied Mathematics 483 and Statistics 407.</td>
<td></td>
</tr>
</tbody>
</table>

### Graduate Courses

In addition to the prerequisites listed below, consent of the Applied Mathematics Division is a prerequisite for all graduate courses in Applied Mathematics.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Mathematics 601</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Topics in Applied Mathematics</strong></td>
<td>Topics will be chosen according to the interests of instructors and students.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Division.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics 605</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Applied Mathematics 411 and Pure Mathematics 445 or 545 or equivalents.</td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics 613</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Partial Differential Equations II</strong></td>
<td>Fundamental solutions, integral equations, eigenvalue problems, non-linear problems.</td>
<td></td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td>Consent of the Division.</td>
<td></td>
</tr>
</tbody>
</table>
Courses of Instruction

Applied Mathematics 617
(formerly Pure Mathematics 617)

Analysis IV
Analysis in abstract spaces. Function spaces.
Prerequisite(s): Pure Mathematics 545.

Applied Mathematics 621
Research Seminar
Reports on studies of the literature or of current research.
Note: All graduate students in Mathematics and Statistics are required to participate in one of Applied Mathematics 621, Pure Mathematics 621, Statistics 621 each semester.
MAY BE REPEATED FOR CREDIT NOT INCLUDED IN GPA

Applied Mathematics 643
H(3-0)

Perturbation Theory
Perturbation problems for ordinary differential equations, matrices and more general operators. Applications. Methods will be motivated by discussion of physical problems.
Prerequisite(s): Familiarity with complex variables, linear algebra and differential equations.

Applied Mathematics 671
H(3-0)

Numerical Linear Algebra
Iterative and elimination methods for linear systems of equations, determination of eigenvalues, linear and convex programming.
Prerequisite(s): Applied Mathematics 441 or Mathematics 411; and Applied Mathematics 491.

Applied Mathematics 673
H(3-0)

Approximation Theory
Existence, uniqueness of minimal solutions, Haar systems, characterization by alternation, Remez algorithm, monotone operators, spline approximation.
Prerequisite(s): Applied Mathematics 491; and Pure Mathematics 435 or 455.

Applied Mathematics 677
H(3-0)

Numerical Solution of Partial Differential Equations
Explicit and implicit methods for PDE, difference equations.
Prerequisite(s): Applied Mathematics 311 and 491.

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 at the advanced doctoral level. These courses are numbered in the series 800.01 to 899.99. Such offerings are, of course, conditional upon the availability of staff resources.

Applied Psychology APSY
Instruction offered by members of the Division of Applied Psychology in the Faculty of Education.
Associate Dean – T. Strong

Graduate Courses
Note: Graduate courses within the Division of Applied Psychology can be taken only with consent of the Division of Applied Psychology and in specific cases additional requirements may be necessary (see below).

Applied Psychology 602
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.

Applied Psychology 603
H(3-0)
Ethics in Applied Psychology
Ethical and legal issues in applied psychology. Professional issues in practice settings.
Prerequisite(s): Consent of the Division.

Applied Psychology 605
H(3-2)
Research Design and Statistics in Applied Psychology
Research design and statistics, including methods for research in applied psychology and related laboratory instruction.

Applied Psychology 606
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.

Applied Psychology 607
H(3-2)
Research in Applied Psychology - Multivariate Analysis
Research design and statistics in applied psychology, with special reference to large sample techniques.
Prerequisite(s): Applied Psychology 301 and 303 or equivalents.

Applied Psychology 608
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.

Applied Psychology 611
H(3-2)
Qualitative Research Methodologies
Advanced study of qualitative research methods for use in applied psychology and education.
Prerequisite(s): Applied Psychology 301 and 303 or consent of the Division.

Applied Psychology 615
H(3-0)
(formerly Applied Psychology 693.24)
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.

Applied Psychology 616
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): Applied Psychology 602 and 622.

Applied Psychology 617
H(3-3)
Psychological Assessment of Adults
The purpose of this course is to provide 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): Applied Psychology 615.

Applied Psychology 619
H(3-0)
Counselling Girls and Women
Sex role development; stereotyping and social roles; counselling theories; counselling approaches.

Applied Psychology 621
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 consent of the Division.
Corequisite(s): Prerequisite or Corequisite: Applied Psychology 623.

Note: Not open to Open Studies students.
Courses of Instruction

**Applied Psychology 622**  H(3S-0)

*Developing and Sustaining a Working Alliance with Clients*

Focusses 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.

**Prerequisite(s):** Prerequisite or Corequisite: Applied Psychology 602.

**Applied Psychology 623**  H(3-0)

*Theory in Counselling*

History and systems involved in counselling psychology and client change.

**Prerequisite(s):** Consent of the Division.

**Applied Psychology 625**  H(3-0)

*Cultural Influences on Professional Practice*

An examination of cultural influences on theory and practice in applied psychology.

**Prerequisite(s):** Consent of the Division.

**Applied Psychology 627**  H(3-1)

*Group Processes in Applied Psychology*

Theory of group practice in applied psychology, with experiential laboratory.

**Applied Psychology 628**  H(2-2)

*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):** Applied Psychology 602 and 62.

**Applied Psychology 629**  H(3S-2)

*Theory and Applications: Selected Topics*

**Prerequisite(s):** Consent of the Division.

MAY BE REPEATED FOR CREDIT

**Applied Psychology 631**  H(3-0)

*Theories of Career Development*

Study of career development theory and related research; implications for the applied field.

**Applied Psychology 632**  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):** Applied Psychology 602, 603, 622 and 625.

**Applied Psychology 633**  H(2-2)

*Career Counselling*

Laboratory and field experiences in career counselling.

**Prerequisite(s):** Applied Psychology 631.

**Applied Psychology 634**  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):** Campus Alberta Applied Psychology 625 and 631.

**Applied Psychology 635**  H(3-0)  (formerly Applied Psychology 693.54)

*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.

**Prerequisite(s):** Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.

**Applied Psychology 636**  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.

**Applied Psychology 637**  H(3-0)

*Relationship Counselling*

Review of theory and systems in marriage and family counselling. Structured observation activities.

**Corequisite(s):** Prerequisite or Corequisite: Applied Psychology 640 or consent of the Division.

**Applied Psychology 638**  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):** Applied Psychology 602 and 622.

**Applied Psychology 639**  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):** Applied Psychology 621 and 623 or consent of the Division.

NOT INCLUDED IN GPA

**Applied Psychology 640**  F(2-7)

*Practicum in Counselling Psychology*

Supervised counselling experience and related seminars.

**Prerequisite(s):** Applied Psychology 621, 623, 625 and consent of the Division.

**Corequisite(s):** Prerequisites or Corequisites: Applied Psychology 639 and one of 601, 615, or 685, or equivalent.

Note: Not open to Open Studies Students.

NOT INCLUDED IN GPA

**Applied Psychology 641**  H(3-0)

*Development, Learning and Cognition - Child and Adolescence*

The interactions of development, learning and cognition in childhood and adolescence.

**Applied Psychology 642**  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):** Applied Psychology 602, 603, 616, 622, 625, 638 and consent of the Division.

NOT INCLUDED IN GPA

**Applied Psychology 643**  H(3-0)

*Development, Learning and Cognition - Adult*

The interactions of development, learning and cognition in childhood and adulthood.

**Applied Psychology 644**  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):** Applied Psychology 616, 638 and 642.

NOT INCLUDED IN GPA

**Applied Psychology 646**  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.

**Applied Psychology 648**  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.

**Applied Psychology 650**  H(3-0)  (formerly Applied Psychology 693.48)

**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.

**Applied Psychology 651**  H(3-0)  (formerly Applied Psychology 683)

**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.

**Prerequisite(s):** Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applied Psychology 652</strong></td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Academic and Language Assessment</strong></td>
<td></td>
<td>Course provides a broad understanding of the standards that guide assessment practices through an examination of assessment of academic areas and language skills.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>Anti-requisite(s):</strong></td>
<td></td>
<td>Not open to students with credit in Applied Psychology 667.</td>
</tr>
<tr>
<td><strong>Applied Psychology 654</strong></td>
<td>H(3-0)</td>
<td>(formerly Applied Psychology 693.62)</td>
</tr>
<tr>
<td><strong>Neurobiological and Developmental Bases of Learning and Behaviour</strong></td>
<td></td>
<td>Course examines the field of cognitive neuroscience from an assessment framework. It explores the evolving understanding of neurobehavioural disorders and new testing techniques and practices.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>Applied Psychology 656</strong></td>
<td>F(1-14)</td>
<td>(formerly Applied Psychology 695.07)</td>
</tr>
<tr>
<td><strong>PRACTICUM IN ACADEMIC AND LANGUAGE ASSESSMENT AND INTERVENTION</strong></td>
<td></td>
<td>This 200-hour practicum provides opportunities to develop competencies in academic and language assessment and interventions within an approved setting.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>NOT INCLUDED IN GPA</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Applied Psychology 657</strong></td>
<td>H(3-0)</td>
<td>(formerly Applied Psychology 693.71)</td>
</tr>
<tr>
<td><strong>Cognitive and Neuropsychological Assessment</strong></td>
<td></td>
<td>Focuses on the theory and practice of intellectual/cognitive, memory, and neuropsychological assessment primarily through the use of individually administered standardized tests.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>Applied Psychology 658</strong></td>
<td>H(3-0)</td>
<td>(formerly Applied Psychology 693.65)</td>
</tr>
<tr>
<td><strong>INTERVENTIONS TO PROMOTE COGNITIVE, ACADEMIC, AND NEUROPSYCHOLOGICAL WELL-BEING</strong></td>
<td></td>
<td>Focuses on evidence-based interventions aimed at promoting cognitive, academic, and neuropsychological development in children and youth.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>Applied Psychology 660</strong></td>
<td>H(3-0)</td>
<td>(formerly Applied Psychology 689)</td>
</tr>
<tr>
<td><strong>Social, Emotional, and Behavioural Assessment</strong></td>
<td></td>
<td>Grounded in biocultural systems perspective and developmental and resiliency frameworks, course focuses on the comprehensive assessment of children and youth referred for social, emotional, and behavioural concerns.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>Applied Psychology 661</strong></td>
<td>H(3-0)</td>
<td>Psychological Foundations of Student Exceptionality</td>
</tr>
<tr>
<td><strong>Psychological Approaches to Health</strong></td>
<td></td>
<td>Major trends, developments, theoretical foundations, and current practices and challenges relative to the education of students with diverse learning needs.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in Applied Psychology programs or permission of the Division.</td>
</tr>
<tr>
<td><strong>Applied Psychology 664</strong></td>
<td>H(3S-0)</td>
<td>Psychological Approaches to Health</td>
</tr>
<tr>
<td><strong>Assessment of Students with Exceptional Learning Needs</strong></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Open to students enrolled in the School and Applied Child Psychology program or permission of the Division.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td></td>
<td>Not open to students with credit in Applied Psychology 652.</td>
</tr>
<tr>
<td><strong>Applied Psychology 665</strong></td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td><strong>Theory and Practice of Clinical Supervision</strong></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Applied Psychology 602, 603, 622, and 629.</td>
</tr>
<tr>
<td><strong>Applied Psychology 667</strong></td>
<td>H(3S-0)</td>
<td>Final Project Seminar</td>
</tr>
<tr>
<td><strong>Practice in School-based Interventions for Children and Youth with Exceptional Learning Needs: I</strong></td>
<td></td>
<td>Practicum in educational interventions for children and adolescents with special learning needs. Focus on general assessment, analysis, intervention, and strategies in applied settings.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Applied Psychology 661 or equivalent.</td>
</tr>
<tr>
<td><strong>Applied Psychology 671</strong></td>
<td>H(1-3)</td>
<td></td>
</tr>
<tr>
<td><strong>Play Therapy Theory and Process</strong></td>
<td></td>
<td>The theoretical foundations and basic orientation necessary to understand and use play therapy are outlined, along with the developmental underpinnings of play in children and the basic principles upon which child-centered play therapy is built.</td>
</tr>
<tr>
<td><strong>Applied Psychology 672</strong></td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Art Therapy History</strong></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Prerequisite(s):</strong></td>
<td></td>
<td>Applied Psychology 642, 616, and 638.</td>
</tr>
</tbody>
</table>
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Psychology 679</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Fundamentals of Solution-Oriented Therapy</strong></td>
<td></td>
<td>Provides a working knowledge of the theory and practice of solution-oriented therapy and related models.</td>
</tr>
<tr>
<td>Applied Psychology 680</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Counselling Graduate Practicum: Selected Topics</strong></td>
<td></td>
<td>Graduate Practicum: Selected Topics.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td>Applied Psychology 682</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Special Topics: Counselling</strong></td>
<td></td>
<td>Graduate Seminar: Special Topics.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td>Applied Psychology 684</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td><strong>Advanced Seminar in the Domains of School Psychology Leadership and Function in the Schools</strong></td>
<td></td>
<td>This course provides an advanced study of the domains and functions of school and applied child psychologists. Constituting a final course within the MEd program, 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.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
</tr>
<tr>
<td>Note:</td>
<td></td>
<td>Open only to students enrolled in the MEd program in School and Applied Child Psychology who have completed all other course work prior to enrolment.</td>
</tr>
<tr>
<td>Applied Psychology 686</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Counselling Graduate Seminar: Selected Topics</strong></td>
<td></td>
<td>Graduate Seminar: Selected Topics.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td>Applied Psychology 691</td>
<td>Q(1.5S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Seminar: Selected Topics</strong></td>
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<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td>Applied Psychology 692</td>
<td>F(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Seminar: Selected Topics</strong></td>
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<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td>Applied Psychology 693</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Seminar: Selected Topics</strong></td>
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<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
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</tr>
<tr>
<td>Applied Psychology 694</td>
<td>F(1S-3)</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Practicum: Selected Topics</strong></td>
<td></td>
<td></td>
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<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
</tr>
<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Psychology 695</td>
<td>H(1S-3)</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Practicum: Selected Topics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of the Division.</td>
</tr>
<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
<td></td>
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<tr>
<td>Applied Psychology 696</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Pre-Master’s Internship in School and Applied Child Psychology</strong></td>
<td></td>
<td>This 1200 hour internship requires the integration and application of the full range of school psychology competencies and domains within an approved setting.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Consent of Training Director. Open only to students enrolled in the MEd or MSc in School and Applied Child Psychology.</td>
</tr>
<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<td></td>
</tr>
<tr>
<td>Applied Psychology 698</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Practicum in Counselling</strong></td>
<td></td>
<td></td>
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<tr>
<td>Prerequisite(s):</td>
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<td></td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<td></td>
</tr>
<tr>
<td>Applied Psychology 701</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Research Design, Psychometrics and Statistics in Applied Psychology</strong></td>
<td></td>
<td>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).</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Applied Psychology 607 or equivalent.</td>
</tr>
<tr>
<td>Applied Psychology 703</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Seminar in Applied Psychology</strong></td>
<td></td>
<td>Doctoral seminar in issues in applied psychology. Dissertation development.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
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<tr>
<td>Applied Psychology 705</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Seminar in Special Education I</strong></td>
<td></td>
<td>Advanced study of theoretical, empirical, and practical issues affecting individuals with exceptional learning needs.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Applied Psychology 661 or equivalent.</td>
</tr>
<tr>
<td>Applied Psychology 709</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Seminar in Applied Learning and Developmental Psychology I</strong></td>
<td></td>
<td>Advanced study of theory and practice in human development and learning.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Psychology 713</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Clinical Supervision in Applied Psychology</strong></td>
<td></td>
<td>This course 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.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Open only to doctoral students in School and Applied Child Psychology and Counselling Psychology or permission of the Division.</td>
</tr>
<tr>
<td>Applied Psychology 723</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Seminar in School and Applied Child Psychology</strong></td>
<td></td>
<td>Seminar series that links theory and research with practice in the school psychology domains of professional competence.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td></td>
<td>Open only to doctoral students in School and Applied Child Psychology.</td>
</tr>
<tr>
<td>Applied Psychology 741</td>
<td>H(3-2)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Professional Skills and Issues</strong></td>
<td></td>
<td>This course focuses on providing knowledge and developing skills in the areas of consultation, supervision, and program development and evaluation across the lifespan.</td>
</tr>
</tbody>
</table>

Note: 700-level courses are normally available only to students in the Applied Psychology doctoral program.

NOT INCLUDED IN GPA
### Undergraduate Courses

**Archaeology 501**  
*H(3-0)*  
**Practical Problems in Archaeological Interpretation**  
Exercises in the analysis and interpretation of a variety of archaeological data sets.  
**Prerequisite(s):** Archaeology 201 or 205 or consent of the Department.

**Archaeology 503**  
*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 or consent of the Department.

**Archaeology 505**  
*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**  
*F(0-7)*  
**Advanced Archaeological Field Techniques**  
As a continuation of Archaeology 506, students are offered training in the more advanced aspects of fieldwork.  
**Prerequisite(s):** Pure Mathematics 30; Archaeology 201 and 306.  
**Note:** Normally offered during the Spring and/or Summer Terms.

**Archaeology 523**  
*H(3-0)*  
**Human Ecological Systems**  
The development of human ecology, its current directions and application of analytical techniques as they apply to anthropology, archaeology and geography.  
**Prerequisite(s):** Pure Mathematics 30; consent of the Department.  
**Antirequisite(s):** Not open to students with credit in Archaeology 609, Anthropology 609 and Geography 609.

**Archaeology 531**  
*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**  
*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**  
*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**  
*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.  
**Prerequisite(s):** Not open to students with credit in Archaeology 531.61.

**Archaeology 555**  
*H(3-2)*  
**Human Osteology**  
Introduction to identification and interpretation of human skeletal and dental remains. Emphasis is on functional anatomy and reconstruction of prehistoric lifeways.  
**Prerequisite(s):** Archaeology 203 or consent of the Department.  
**Antirequisite(s):** Not open to students with credit in Archaeology 613.

**Archaeology 589**  
*(Anthropology 589)*  
*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):** Pure Mathematics 30; Anthropology 201 or Archaeology 203 or Archaeology 305, and consent of the Department.

**Archaeology 591**  
*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**  
*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**  
*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):** Pure Mathematics 30; Archaeology 203 or consent of the Department.  
**Antirequisite(s):** Archaeology 555 is recommended.

**Archaeology 596**  
*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**  
*H(3-0)*  
**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**  
*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.

**Archaeology 599**  
*H(3-0)*  
**Independent Readings in Archaeology**  
An independent reading course for archaeology majors. Emphasis will be on the methodological, technical and scientific literature relating to archaeological interpretation. Each student is required to choose reading in consultation with an advisor.  
**Prerequisite(s):** Consent of the Department.

**Graduate Courses**

**Archaeology 601**  
*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.
Courses of Instruction

Archaeology 603
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 605
Advanced Zooroarchaeology
Specialized techniques of zooroarchaeological analysis employed in research areas including site seasonality, aging and sexing, paleo-environmental reconstruction and identification techniques for non-mammalian species.
Prerequisite(s): Archaeology 417 or equivalent.

Archaeology 607
Interpretation in Lithic Analysis
Lithic analysis methodology, including issues such as reduction stage analysis, usewear and residue analysis, material sourcing, replication, and spatial patterning. The use of lithic remains in interpretation of the social behaviour of archaeological cultures.
Prerequisite(s): Consent of the Department.

Archaeology 611
Advanced Geoarchaeology
Critical evaluation of case studies and field examples to explore analytical methods and interdisciplinary theoretical approaches used in geoarchaeology. Field projects will be accompanied by seminar discussions of methodological and analytical approaches to geoarchaeology.
Prerequisite(s): Archaeology 453, or Geography 307, or Geology 373, or consent of the Department.

Archaeology 613
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.
Prerequisite(s): Not open to students with credit in Archaeology 555 or 603.07.

Archaeology 615
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
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 biocultural approach will be emphasized.
Prerequisite(s): Consent of the Department.

Archaeology 619
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 or consent of the Department.

Archaeology 621
Problems in Ethnoarchaeology
Seminar on selected topics relating to ethnoarchaeology.
Prerequisite(s): Consent of the Department.

Archaeology 625
Hunter-Gatherer Adaptations
Intensive study of contemporary and prehistoric hunter-gatherer social and economic adaptations.

Archaeology 627
Origins of Agriculture
Intensive study of the origins of agriculture throughout the world.

Archaeology 629
Advanced Ceramic Analysis
Studies in ceramic analysis, including typology, manufacturing techniques, use-wear, form/function and style.

Archaeology 631
The Development of Complex Societies
The rise, development, and collapse of complex societies throughout the world.
Prerequisite(s): Consent of the Department.

Archaeology 633
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
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
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
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
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

Art ART
Instruction offered by members of the Department of Art in the Faculty of Arts.
Department Head – J.R. Leblanc

Graduate Courses

Art 601
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): Consent of the Department.

Art 603
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 or consent of the Department.

Art 605
Critical Study and Research
Individual study and research in the area of studio specialization, critical theory, methodological issues and/or historical topics.
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Art 661
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: consent of the Department; for Art 661.02, the prerequisite is Art 661.01.
Courses of Instruction

Art 691  H(3-0)
Pedagogy and Professional Practice
Issues in professional practice and post-secondary teaching in visual art. Optional course.
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Art 699  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  H(2T-10)
Advanced Independent Studio research
Theoretical and applied concepts in studio.
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Art History ARHI
Instruction offered by members of the Department of Art in the Faculty of Arts.
Department Head – J.R. Leblanc

Graduate Courses
Art History 613  H(3-0)
Independent Study in Art History
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Art History 615  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  H(3-0)
Thesis Development
A reading and conference course in the student’s research area.
Prerequisite(s): Consent of the Department.

Astrophysics ASPH
Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.
Department Head - A.R. Taylor

Undergraduate Courses
Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599, which are undergraduate courses.

Astrophysics 503  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; Hill regions; interstellar shocks; gas dynamics; star formation.
Prerequisite(s): Astrophysics 403.

Astrophysics 507  H(1-6)
Senior Astrophysics Laboratory
Lectures and laboratory sessions in observational astronomy. Modern methods of observation, data reduction, and analysis. Observations will be carried out at the Rotheny Astrophysical Observatory and/or the main campus.
Prerequisite(s): Astronomy 213 or Astrophysics 213.
Corequisite(s): Prerequisite or Corequisite: Any 400-level Astrophysics course.

Astrophysics 509  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 503.

Graduate Courses

Astrophysics 607  H(3-3)
Advanced Observational Astrophysics
Principles and tools of modern ground-based 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  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  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.

Astrophysics 699  H(0-9)
Projects in Astrophysics
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.

Biochemistry 543  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  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  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. Crystalization 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 555  H(3-1T-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 393 or 443.
Note: Prior or concurrent completion of Biochemistry 431 and 471 is strongly recommended.

Biochemistry 561  H(2-3T)
Applied Biochemistry and Biotechnology
An introduction to the language, materials, methods, concepts and commercial applications of biotechnology with emphasis on methodology: biocatalysts, bioreactor designs and operation, scale-up, instrumentation, product recovery, animal and plant cell culture, process economics.
Prerequisite(s): Biochemistry 393.
Antirequisite(s): Credit for both Biochemistry 561 and Biotechnology 561 will not be allowed.
Note: Prior completion of Cellular, Molecular and Microbial Biology 411 or Biochemistry 401 is strongly recommended.
Courses of Instruction

Biochemistry 575  H(3-2T-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 or 443.

Biochemistry 577  H(3-4/2)

Biomolecular Simulation
Introduction to simulation and computer modeling 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.

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  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  H(3-0)

Current Topics in Biochemistry
Contemporary methods of recombinant DNA technology will be combined with modern methods and strategies for expressing, secreting, purifying and characterizing proteins. This will include biophysical techniques, structural analysis and covalent modifications. Various modern ‘omics’ research approaches will also be discussed.

Biology BIOL
Instruction offered by members of the Department of Biological Sciences in the Faculty of Science. Department Head - R.M.R. Barclay

Undergraduate Courses

Biology 501  H(3-0)
( Medical Science 501)

Principles and Mechanism of Pharmacology
Basic principles of pharmacology, with specific emphasis on receptor signaling mechanisms.

Prerequisite(s): Consent of the Department and Biochemistry 443, and one of Zoology 461, 463, or Medical Science 404.

Biology 503  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) or consent of the Department.

Biology 505  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  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  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 savanna sites with consideration of community-based conservation efforts.

Prerequisite(s): Consent of the Department.

Biology 551  H(3-0)

Systems Biology
An overview of theoretical concepts and high-throughput technologies in systems biology. Functional genomics, genetic circuits, gene-regulatory networks, and systems dynamics as applied to the control of development.

Prerequisite(s): Biology 331 and Biochemistry 393 and one of Math 239 or 251 or 281.

Note: Prior completion of Computer Science 217 or 231; and Math 211 or 213 is strongly recommended.

Biology 553  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.

Biology 591  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): 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  H(2S-0)

Research Seminar

NOT INCLUDED IN GPA

Biology 603  H(2-1)
( 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.
Courses of Instruction

Biology 607 H(3-3)  
Special Problems in Biology  
Lectures, seminars, term papers and training in theoretical and/or laboratory methods.  
MAY BE REPEATED FOR CREDIT

Biology 609 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 nonlinear 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 42S) is required.  
Note: Offered during odd-even dated academic years.

Biology 619 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 651 H(3-0)  
Topics in Systems Biology  
In-depth discussions of the latest publications in systems biology, with emphasis on the fundamental principles of genome and cell function.  
Note: Offered during odd-even dated academic years.

Biology 653 H(3-0)  
Topics in Functional Genomics  
Presentation and discussion of the primary literature in high-throughput methods for global functional and network analysis of genes and proteins (reverse genetics, microarrays, two hybrid, mass spectrometry and FISH screening).  
Note: Offered during odd-even dated academic years.

Biology 703 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 and Kinesiology.  
Associate Dean (Academic, Planning & Research)  
– R. Brennan  
Director, Centre for Bioengineering Research and Education – E. Vigmond

Graduate Courses

Biomedical Engineering 605 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 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 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 611 Q(3-0)  
Fundamentals of Biomedical Engineering - Core Area  
An introduction to biology, biochemistry, anatomy, physiology and biomedical engineering fundamentals.  
Prerequisite(s): Biomedical Engineering 601

Biomedical Engineering 612 Q(3-0)  
Fundamentals of Biomedical Engineering - Research Areas  
Detailed discussion on current biomedical engineering topics, including current local and international research and industry, with an emphasis on local strengths.  
Prerequisite(s): Biomedical Engineering 603

Biomedical Engineering 613 Q(3-0)  
Frontiers of Biomedical Engineering - Scientific Communication  
An introduction to technical (oral and written) communication to diverse audiences.  
Prerequisite(s): Biomedical Engineering 603

Biomedical Engineering 614 Q(3-0)  
Frontiers of Biomedical Engineering - Research Methods  
An introduction to research methodology in biomedical engineering, experimental design, research integrity, ethics, and preparation and review of research proposals. Satisfactory completion of this course within 1 year of registration will ensure that the Biomedical Engineering Graduate Program Research Proposal requirements are met.

Biomedical Engineering 619 H(3-1)  
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  
An introduction to basic principles of genome and cell function.

Botany 541 H(3-3) (formerly Botany 441)  
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.

Botany 543 H(3-3)  
Plant Cell and Developmental Biology  
Physiology, biochemistry, molecular and cellular aspects of plant growth and development. Emphasis on the coordinated 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): Botany 331 and Botany 303 or 321.  
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.

Botany 633 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
Courses of Instruction

Botany 645 H(3-2S)

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.

Botany 745 H(0-6)

Plant Biology Microtechniques
Principles and practice of preparation of plant tissues for light and electron microscope study. Plastic embedding techniques, histochemistry, immunohistochemistry, quantitative cytometry, fluorescence microscopy, confocal laser scanning microscopy and photomicroscopy are included.

Note: Offered during even-odd dated academic years.

Business and Environment BSEN
Instruction offered by members of the Haskayne School of Business.

Business and Environment Chairperson — S. Malach

Graduate Courses

Business and Environment 691 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 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 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 H(3-0)
(formerly Strategy and General Management 789.12)

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 H(3-0)
(formerly Strategy and General Management 797.04)

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 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 H(3-0)

Global Environment of Canadian 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 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 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, Management Information Systems 601, Accounting 801 or equivalent.

Business and Environment 797 H(3S-0)

Advanced Seminar in Business and Environment
Prerequisite(s): Consent of the Haskayne School of Business.

MAY BE REPEATED FOR CREDIT

Campus Alberta Applied Psychology CAAP

Note: Students not in the Master of Counselling program may take these courses with consent of the Division of Applied Psychology and in specific cases additional requirements may be necessary (see below).

Associate Dean - T. Strong

Graduate Courses

Campus Alberta Applied Psychology 601 H(3-0)

Theories of Counselling and Client Change
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.

Campus Alberta Applied Psychology 603 H(3-0)

Professional Ethics
Addresses personal and professional ethical issues in counselling. The perspectives of different professional disciplines will be used to highlight commonalities and differences. Students will reflect critically on both personal and collective world-views and values as well as explore the impact of those perspectives on counselling processes and contexts.

Campus Alberta Applied Psychology 605 H(2-2)

Developing a Working Alliance
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: Campus Alberta Applied Psychology 601.

Campus Alberta Applied Psychology 607 H(3-0)

Equity and Diversity Issues in Counselling
Focuses on increasing personal awareness, identification of conceptual frameworks, and development of in-depth knowledge of equity and diversity issues in counselling. Students will be expected to examine their own attitudes, behaviours, perceptions and biases.

Campus Alberta Applied Psychology 611 H(2-7)

General Counselling Practicum
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): Campus Alberta Applied Psychology 601, 603, 605, 607, 613 and 615 and consent of the Campus Alberta Program.

NOT INCLUDED IN GPA
Intervening to Facilitate 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): Campus Alberta Applied Psychology 601 and 605.

Campus Alberta Applied Psychology 615 H(2-2)

Methods of Inquiry
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.

Campus Alberta Applied Psychology 617 H(3-2)

Specialized Practicum
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): Campus Alberta Applied Psychology 611, 613 and 615.

Campus Alberta Applied Psychology 619 H(2-7)

Assessment
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): Campus Alberta Applied Psychology 601 and 605.

Campus Alberta Applied Psychology 613 H(2-2)

Foundation of Career Development
Focuses on major theories and models of career development and related research. Emphasis will be placed on the integration of theory with career counselling practice.
Prerequisite(s): Campus Alberta Applied Psychology 601.

Campus Alberta Applied Psychology 621 H(3-0)

Processes and Resources for Facilitating Career-Life Transitions
Provides knowledge of common issues associated with career-life transitions as they pertain to models of career counselling. Students also acquire knowledge about various types of career development resources and gain critical skills for selecting and using resources to facilitate career-life transitions.
Prerequisite(s): Campus Alberta Applied Psychology 605 and 621.

Campus Alberta Applied Psychology 623 H(3-0)

Multicultural Issues in Career Development
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): Campus Alberta Applied Psychology 601, 603, 605 and 607.

Campus Alberta Applied Psychology 629 H(3-0)

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.

Campus Alberta Applied Psychology 633 H(3-0)

Health Psychology
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): Campus Alberta Applied Psychology 601, 607 and 617.

Campus Alberta Applied Psychology 635 H(3-0)

Learning Processes
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.

Campus Alberta Applied Psychology 631 H(3-0)

Career Development in 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): Campus Alberta Applied Psychology 601, 603, 605 and 607.

Campus Alberta Applied Psychology 627 H(3-0)

Systemic Community Change: A Comprehensive Approach to Human Service Delivery
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.

Campus Alberta Applied Psychology 625 H(3-0)

Prerequisite(s):

Graduate Seminar: Special Topics
Prerequisite(s): Consent of the Campus Alberta Program.
MAY BE REPEATED FOR CREDIT
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Enrollment Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cellular, Molecular, and Microbial Biology CMMB</strong></td>
<td></td>
</tr>
<tr>
<td>Instruction offered by members of the Department of Biological Sciences in the Faculty of Science. Department Head - R.M.R. Barclay</td>
<td></td>
</tr>
<tr>
<td><strong>Undergraduate Courses</strong></td>
<td></td>
</tr>
<tr>
<td>Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599.</td>
<td></td>
</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 505</strong></td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Advanced Developmental Biology</td>
<td></td>
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<tr>
<td>In-depth analyses of the current literature in developmental biology. Emphasis will be on the coordinated regulation of gene expression during development.</td>
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</tr>
<tr>
<td><strong>Prerequisite(s):</strong> Cellula r, Molecular and Microbial Biology 403 and Biochemistry 401 or 443.</td>
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</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 511</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Molecular Biology and Genetics</td>
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<tr>
<td>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.</td>
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</tr>
<tr>
<td><strong>Prerequisite(s):</strong> Cellular, Molecular and Microbial Biology 411.</td>
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</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 519</strong></td>
<td>H(3-0)</td>
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<tr>
<td>Advanced Cell Biology</td>
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<tr>
<td>In-depth analysis of current literature in cell biology. Topics include the cytoskeleton, subcellular organization and dynamics, RNA and protein trafficking, and other aspects of eukaryotic cell biology.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Biology 311 and 331 and one of Biochemistry 401 or 443.</td>
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</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 523</strong></td>
<td>H(3-0)</td>
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<tr>
<td>DNA, Genomes and RNA Function</td>
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<tr>
<td>An examination and comparison of the roles of DNA and RNA in the cell, includes chromatin structure, transcriptional regulation, mechanisms of post-transcriptional regulation at the RNA level, and the diverse roles played by RNA, ranging from information molecules to structural scaffolds to ribozymes.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Cellular, Molecular and Microbial Biology 411.</td>
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</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 527</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Immunology</td>
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</tr>
<tr>
<td>Comprehensive overview of the immune responses: antibody-antigen interaction, antibody structure, genetics and synthesis, cellular immunology, MHC, phagocytosis, tolerance, autoimmunity, hypersensitivity, tissue rejection, tumour immunology and vaccine production. Responses to viral, bacterial, fungal and parasite infections. Methods for the study of immunology.</td>
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</tr>
<tr>
<td><strong>Prerequisite(s):</strong> Biology 311 and 331 and Cellular, Molecular and Microbial Biology 343 and one of Biochemistry 401 or 443.</td>
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</tr>
<tr>
<td><strong>Antirequisite(s):</strong> Credit for both Cellular, Molecular and Microbial Biology 527 and 427 will not be allowed.</td>
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</tr>
<tr>
<td><strong>Note:</strong> Enrolment in this course may be limited. See Program Details in the Faculty of Science section of this Calendar.</td>
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</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 531</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Topics in Cellular Interactions</td>
<td></td>
</tr>
<tr>
<td>An exploration of selected topics concerning cell-cell interactions and the interactions of cells with their environment during development, differentiation and disease. 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 remodeling and stem cells.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Biology 331 and one of Biochemistry 443 or 431 or 401.</td>
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<tr>
<td><strong>Antirequisite(s):</strong> Credit for both Cellular, Molecular and Microbial Biology 531 and 507.90 will not be allowed.</td>
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</tr>
<tr>
<td><strong>Note:</strong> Prior completion of Cellular, Molecular and Microbial Biology 531 and 507.90 will not be allowed.</td>
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<tr>
<td><strong>Cellular, Molecular and Microbial Biology 560</strong></td>
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<tr>
<td>Cancer Biology</td>
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<tr>
<td>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.</td>
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</tr>
<tr>
<td><strong>Prerequisite(s):</strong> Biology 331 and Cellular, Molecular and Microbial Biology 411 and one of Biochemistry 401 or 443.</td>
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</tr>
<tr>
<td><strong>Graduate Courses</strong></td>
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</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Cellular, Molecular and Microbial Biology 637</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Advanced Topics in Molecular Microbiology</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</tbody>
</table>
Instruction offered by members of the Department of Chemical and Petroleum Engineering in the Schulich School of Engineering.
Department Head - U. Sundararaj
Associate Heads - T. Harding, J. Azaiez

Graduate Courses

Chemical Engineering 601  E(3S-0)  Research Seminar
Reports on studies of current research in the Department. All Master of Science and Doctoral students (Chemical, Petroleum, and Energy & Environment specializations) are required to register and participate in the course for each of the first two terms of their degree program. Each student must also present one research seminar. For more details, students must refer to the guidelines for the Research Seminar course.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Chemical Engineering 607  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.

Chemical Engineering 609  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 613  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  H(3-1.5)  Model Predictive Control

Chemical Engineering 617  H(3-1.5)  Modelling and Identification Advanced Control

Chemical Engineering 619  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  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 both Chemical Engineering 620 and 690 will not be allowed.

Chemical Engineering 621  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 Petroleum Engineering 523 or consent of the Department.

Chemical Engineering 623  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 multitubed adiabatic reactors. Cold shock 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.

Chemical Engineering 625  H(3-0)  Advanced Topics in Heat Transfer

Chemical Engineering 627  H(3-0)  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  H(3-0)  Secondary and Tertiary Recovery

Prerequisite(s): Petroleum Engineering 525 or consent of the Department.

Chemical Engineering 631  H(3-0)  Advanced Topics in Fluid Mechanics

Chemical Engineering 633  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 or consent of the Department.

Chemical Engineering 639  H(3-0)  Applied Numerical Methods in Engineering

Prerequisite(s): Engineering 407 or consent of the Department.

Note: Knowledge of a programming language is necessary.

Chemical Engineering 643  H(3-0)  (Environmental Engineering 641)  Air Pollution Control Engineering
Introduction to air quality and air pollution. Impact of air pollution and greenhouse gases on health and climate change. Energy and air pollution. Fundamentals of fossil fuel combustion and related air pollution. Pre-combustion air pollution control strategies: fossil fuel cleaning/refinery, renewable energy (wind, solar, biomass, etc.), and alternative energy sources (hydrogen, etc). In-combustion air pollution control. Post-combustion air pollution control. Industrial air pollution control. Control of particulate matter, Control of VOCs, SOx, and NOx. Adsorption and absorption of air pollutants. GHG emission control. Indoor air quality engineering. Recent advances on related topics.

Antirequisite(s): Credit for both Chemical Engineering 643 and Environmental Engineering 641 will not be allowed.

Chemical Engineering 645  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 both Chemical Engineering 645 and Environmental Engineering 661 will not be allowed.

Chemical Engineering 647  H(3-0)  Thermal Recovery Methods
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 649</td>
<td>Naturally Fractured Reservoirs</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 661</td>
<td>Geostatistics for Reservoir Characterization</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 699</td>
<td>Special Project</td>
<td>H(0-4)</td>
</tr>
<tr>
<td>Engineering Fuel Cells</td>
<td>Overview of Fuel Cells. Comparison of fuel cells with other energy technologies. Types of fuel cells; electrochemical reactions; materials and balance of plant.</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 653</td>
<td>Horizontal Wells for Petroleum Production</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 665</td>
<td>Wastewater Issues for the Oil and Gas Industry</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Advanced Reservoir Engineering</td>
<td>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.</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 657</td>
<td>Advanced Topics in Oil and Gas Production</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 659</td>
<td>Advanced Cell and Tissue Engineering</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 667</td>
<td>Petroleum Economics</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 668</td>
<td>Chemical Engineering 703</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 698</td>
<td>Reservoir Characterization for Field Development</td>
<td>F(3-0)</td>
</tr>
<tr>
<td>Chemical Engineering 699</td>
<td>Special Project</td>
<td>H(0-4)</td>
</tr>
</tbody>
</table>

**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.

**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.

**Engineering Fuel Cells**
Overview of Fuel Cells. Comparison of fuel cells with other energy technologies. Types of fuel cells; electrochemical reactions; materials and balance of plant.

**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 vertical, horizontal patterns; performance in fractured reservoirs; potential for horizontal wells in heavy oil and bitumen production; basic conceptual ideas of steam-assisted gravity drainage.

**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.

**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.

**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.

**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.

**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.

**Chemical Engineering 701**
(Formerly Chemical 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).

**Advanced Cell and Tissue Engineering**
Current challenges in tissue engineering. Focus on specific tissues. Course topics include a brief biological review; cell fate processes, stem cells, tissue microenvironments and mass transfer, biomaterials, bioreactors, and clinical delivery of tissue engineered constructs.

**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.

**Note:** This course is intended for graduate students in the Master of Engineering with Reservoir Characterization Specialization.
## Courses of Instruction

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemistry CHEM</strong></td>
<td></td>
</tr>
<tr>
<td>Instruction offered by members of the Department of Chemistry in the Faculty of Science. Department Head - P.G. Kusalik</td>
<td></td>
</tr>
<tr>
<td><strong>Undergraduate Courses</strong></td>
<td></td>
</tr>
<tr>
<td>Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.</td>
<td></td>
</tr>
<tr>
<td>Chemistry 515  H(3-4)</td>
<td></td>
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<tr>
<td><strong>Advanced Instrumental Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s): Chemistry 311 and 315.</td>
<td></td>
</tr>
<tr>
<td>Chemistry 521  H(3-0)</td>
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<tr>
<td><strong>Introduction to Atmospheric Chemistry</strong></td>
<td></td>
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<tr>
<td>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 modeling and atmospheric transport.</td>
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<tr>
<td>Prerequisite(s): Chemistry 315 and 373.</td>
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<tr>
<td>Note: Chemistry 471 is recommended as a prerequisite.</td>
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<tr>
<td>Chemistry 531  H(3-1T)</td>
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<tr>
<td><strong>Advanced Inorganic Chemistry I</strong></td>
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<tr>
<td>Coordination 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.</td>
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<tr>
<td>Prerequisite(s): Chemistry 333 and one of 353 or 355.</td>
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<tr>
<td>Chemistry 533  H(3-1T)</td>
<td></td>
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<tr>
<td><strong>Advanced Inorganic Chemistry II</strong></td>
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<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s): Chemistry 333 and one of 353 or 355.</td>
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<tr>
<td>Chemistry 535  H(1-8)</td>
<td></td>
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<tr>
<td><strong>Advanced Inorganic Laboratory</strong></td>
<td></td>
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<tr>
<td>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.</td>
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<tr>
<td>Prerequisite(s): Chemistry 333 and 453.</td>
<td></td>
</tr>
<tr>
<td>Note: Open to students in Chemistry programs and to others by consent of the Department.</td>
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<tr>
<td>Chemistry 551  H(3-1T)</td>
<td></td>
</tr>
<tr>
<td><strong>Organic Synthesis</strong></td>
<td></td>
</tr>
<tr>
<td>Concepts and strategies of synthesizing molecules with emphasis on carbon-carbon bond-forming reactions, protecting groups, chemo-, regio- and stereoselectivity.</td>
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<tr>
<td>Prerequisite(s): Chemistry 453.</td>
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<tr>
<td>Chemistry 553  H(3-1T)</td>
<td></td>
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<tr>
<td><strong>Bio-organic Chemistry</strong></td>
<td></td>
</tr>
<tr>
<td>Organic chemistry applied to the understanding of biomolecules: selected topics from carbohydrate, peptide/protein, lipid and nucleoside chemistry, enzyme inhibition and drug design.</td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s): Chemistry 453.</td>
<td></td>
</tr>
<tr>
<td>Chemistry 555  H(1-8)</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Organic Laboratory</strong></td>
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</tr>
<tr>
<td>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.</td>
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<tr>
<td>Prerequisite(s): Chemistry 453.</td>
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<tr>
<td>Antirequisite(s): Credit for both Chemistry 555 and 455 will not be allowed.</td>
<td></td>
</tr>
<tr>
<td>Note: Open to students in Chemistry programs and to others by consent of the Department.</td>
<td></td>
</tr>
<tr>
<td>Chemistry 559  H(3-1T)</td>
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</tr>
<tr>
<td><strong>Organic Spectroscopy</strong></td>
<td></td>
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<tr>
<td>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.</td>
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<tr>
<td>Prerequisite(s): Chemistry 351 and one of 353 or 355.</td>
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<tr>
<td>Chemistry 571  H(3-0)</td>
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<tr>
<td><strong>Physical Chemistry of Interfaces</strong></td>
<td></td>
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<tr>
<td>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.</td>
<td></td>
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<tr>
<td>Prerequisite(s): Chemistry 371 and 373.</td>
<td></td>
</tr>
<tr>
<td>Chemistry 573  H(3-0)</td>
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<tr>
<td><strong>Nature of the Condensed Phase in Chemistry</strong></td>
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<tr>
<td>Prerequisite(s): Chemistry 371 and 373.</td>
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</tr>
<tr>
<td>Chemistry 579  H(3-0)</td>
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<tr>
<td><strong>Surface and Colloid Chemistry for Engineers</strong></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s): Chemistry 209, 357 and Chemical Engineering 427.</td>
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<tr>
<td>Chemistry 599  H(3-0)</td>
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</tr>
<tr>
<td><strong>Selected Topics in Chemistry</strong></td>
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</tr>
<tr>
<td>Selected topics are offered based on the interests of Chemistry faculty and students.</td>
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<tr>
<td>Prerequisite(s): Consent of the Department.</td>
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<tr>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td><strong>Graduate Courses</strong></td>
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<tr>
<td>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.”</td>
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<tr>
<td>Chemistry 601  H(25-0)</td>
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<tr>
<td><strong>Research Seminar</strong></td>
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<tr>
<td>Reports on studies of the literature or of current research. Required of all graduate students in Chemistry.</td>
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<tr>
<td>NOT INCLUDED IN GPA</td>
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<tr>
<td>Chemistry 603  H(25-0)</td>
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<tr>
<td><strong>Research Seminar</strong></td>
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<tr>
<td>Continuation of Chemistry 601.</td>
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<td>NOT INCLUDED IN GPA</td>
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<tr>
<td>Chemistry 613  H(3-0)</td>
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<tr>
<td><strong>Electrochemical Fundamentals and Methodologies</strong></td>
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<tr>
<td>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.</td>
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<tr>
<td>Chemistry 615  H(3-0)</td>
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<tr>
<td><strong>Analytical Separations</strong></td>
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<tr>
<td>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.</td>
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</tr>
</tbody>
</table>
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 617</td>
<td>Advanced Analytical Chemistry</td>
<td></td>
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<tr>
<td>Chemistry 619</td>
<td>Selected Topics in Analytical Chemistry</td>
<td></td>
</tr>
<tr>
<td>Chemistry 621</td>
<td>Organometallic Chemistry</td>
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</tr>
<tr>
<td>Chemistry 623</td>
<td>Chemistry of the Main Group Elements</td>
<td></td>
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<tr>
<td>Chemistry 627</td>
<td>Theoretical Inorganic Chemistry</td>
<td></td>
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<tr>
<td>Chemistry 629</td>
<td>Selected Topics in Inorganic Chemistry</td>
<td></td>
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<tr>
<td>Chemistry 651</td>
<td>Advanced Organic Stereochemistry</td>
<td></td>
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<tr>
<td>Chemistry 653</td>
<td>Advanced Organic Spectroscopy</td>
<td></td>
</tr>
<tr>
<td>Chemistry 655</td>
<td>Advanced Organic Synthesis</td>
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<tr>
<td>Chemistry 657</td>
<td>Theoretical Organic Chemistry</td>
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<tr>
<td>Chemistry 659</td>
<td>Selected Topics in Organic Chemistry</td>
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<tr>
<td>Chemistry 669</td>
<td>Selected Topics in Applied Chemistry</td>
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<tr>
<td>Chemistry 681</td>
<td>Crystallography</td>
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<tr>
<td>Chemistry 689</td>
<td>Selected Topics in Physical Chemistry</td>
<td></td>
</tr>
<tr>
<td>Chemistry 701</td>
<td>Independent Study</td>
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</tr>
</tbody>
</table>

### Civil Engineering ENCI

**Instruction offered by members of the Department of Civil Engineering in the Schulich School of Engineering.**

*Department Head - R.C.K. Wong*

*Associate Heads – G. Achari and L. Cowe Falls*

### Undergraduate Courses

Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599, which are considered undergraduate courses.

**Civil Engineering 513**

**Concrete Materials for Sustainable Construction**

Production and use of concrete for sustainability. Fundamental and engineering properties of cement, aggregates, supplementary cementing materials, chemical admixtures, concrete and other ingredients used to improve the performance and sustainability of concrete structures. Methods to reduce energy consumption and environmental impact associated with materials production and construction are emphasized.

**Prerequisite(s):** Civil Engineering 413.

**Civil Engineering 523**

**Civil Engineering 525**

**Applied Geotechnical Engineering**

Selected topics from: soil improvement; foundations in permafrost; machine foundation analysis and soil dynamics; tunneling; geotechnical aspects of mining engineering; deep foundations; retaining structures; computer applications.

**Prerequisite(s):** Civil Engineering 423 and 523.

**Civil Engineering 533**

**Engineering Hydrology and Hydraulics**

Introduction to engineering hydrology; Meteorological factors; Physical hydrology including measurement and estimates of precipitation, inputs, losses, and rainfall-runoff relations; stream flow measurement; hydrograph analysis including baseflow separation and unit hydrographs; Reservoir and river flood routing; Statistical hydrology, probability distributions, frequency analysis; Hydrological design, design storms, design flows; Open channel hydraulics; Design of channels for uniform flow; Gradually varied steady flow, classification and computation of flow profiles; Flow around bridge piers and flow through culverts; Storm sewer design.

**Prerequisite(s):** Mechanical Engineering 341.
Courses of Instruction

Civil Engineering 545  H(3-1)
**Theory of Structures I**

Prerequisite(s): Civil Engineering 461.

Civil Engineering 547  H(3-1)
**Theory of Structures II**

Prerequisite(s): Civil Engineering 545.

Civil Engineering 553  H(3-1)
**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, shear load distribution, shear walls, code provisions, building envelope, detailing, geometric walls, prestressed masonry.

Prerequisite(s): Civil Engineering 451.

Civil Engineering 555  H(3-1)
**Structural Concrete Design**

Prerequisite(s): Civil Engineering 451. Corequisite(s): Civil Engineering 545.

Civil Engineering 557  H(3-1)
**Structural Steel Design**

Prerequisite(s): Civil Engineering 451 and 545.

Civil Engineering 565  H(3-1)
(formerly Civil Engineering 465)
**Engineering and Construction Management**
Introduction to engineering and construction management: planning, scheduling, estimating, cost control; project organization, human resource management; specifications; construction processes; manpower required and their resolution, social, economic and environmental impacts; regulatory requirements; project completion and commissioning.

Prerequisite(s): Civil Engineering 471.

Civil Engineering 569  H(3-1)
**Design 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; mathematical analysis of mode of operation, route alignment, access, station & stop location, transfer protocols, time table, vehicle & fleet size, reliability; concepts of utility and value of time; detailed functional design & optimization of a bus route, rail line; introduction to design of bus and rail networks; and application of ITS concepts to public transport.

Prerequisite(s): Civil Engineering 473.

Civil Engineering 570  F(0-4)
**Group Design Project**
A team design project applying engineering and project management principles to prepare a multidisciplinary design and bid document for a civil engineering project. Students are expected to consult with local industry and professors in the Department. Teams will prepare a final report and will present this report to a committee, comprising of representatives from the Department and industry. Proposals should document and discuss the project development, design and execution plan with an emphasis on the technical, human resources and business aspects of the project. Initial engineering design for all Civil Engineering design aspects including: Environmental, Geotechnical, Hydraulics, Materials, Structural and Transportation. Preparation of design documents and specifications and presentation of competitive bids.

Prerequisite(s): Civil Engineering 413, 423, 451, 461, 473, and 481 or Department approval. Departmental approval will only be granted in exceptional cases if students are missing no more than 10% of full-time credits.

Civil Engineering 571  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 one of Biomedical Engineering 319 or Engineering 319.

Civil Engineering 573  H(3-1)
**Highway Engineering**
Introduction to highway planning and engineering: human factors; road vehicle performance characteristics; highway capacity and level of service; highway classification; design consistency; alignment elements, cross section elements, intersections, interchanges, traffic barriers; road safety audits. Planning and design of bicycle facilities. Environmental impact of highways. Explicit evaluation of safety in road design.

Civil Engineering 575  H(3-1)
**Traffic Engineering and Operations**
Introduction to traffic engineering, traffic stream components, traffic stream characteristics, traffic studies, data collection, speed, travel time and delay studies, speed limits and advisory speeds, accident studies, parking studies, traffic barriers, traffic noise, capacity and level of service, warrants for traffic control devices, principles of intersection signalization, actuated and premitted signals, signal control systems, progression, traffic systems management, local area traffic management studies, intelligent transportation systems, road safety audits.

Prerequisite(s): Biomedical Engineering 319 or Engineering 319 or equivalent.

Civil Engineering 577  H(3-1)
**Modelling of Transportation Systems**
Approaches to mathematical and computer-based modelling for transportation planning; trip generation models, trip distribution models, mode split processes, assignment models; direct demand models; discrete-choice behavioural models; simplified transportation demand models; use of models in design and evaluation.

Prerequisite(s): Civil Engineering 473.

Civil Engineering 579  H(3-1)
**Asphalt Pavement Design and Management**
Planning, designing, constructing and maintaining asphalt pavement: physical parameters, economic considerations and governing specifications; optimum design based on: design loads, subgrade soil mechanics and aggregates; asphalt mix selection and preparation; construction methods; pavement failure mechanisms; prediction of long-term performance based on field and laboratory tests; performance criteria and the implementation of rehabilitation and recycling programs.

Prerequisite(s): Civil Engineering 423 and Geology 471.

Civil Engineering 581  H(3-1)
**Water and Wastewater Engineering**
Water and wastewater quality and quantity, water distribution and wastewater collection systems, hydraulic considerations, flow through pipes and networks, 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, design considerations, sludge processing and disposal.

Prerequisite(s): Civil Engineering 481 and Civil Engineering 341.
Courses of Instruction

**Civil Engineering 587**  
**H(3-1)**  
*Site Assessment and Remediation*  
Environmental impact assessments, environmental audit protocols and plans, pre-assessment planning and preliminary assessment of contaminated sites, site investigation, field techniques and program implementation, remedial planning and design, cost and time analysis, physical, chemical and biological remediation techniques, land treatment, soil vapour extraction and solidification.  
Prerequisite(s): Civil Engineering 481.

**Civil Engineering 589**  
**H(3-1)**  
*Air and Water Pollution*  
Sources of air and water pollution, acute and chronic health effects of pollution, environmental quality standards and compliance criteria, monitoring environmental quality, sampling techniques, fate and transport of pollutants in environmental media, particulates and gaseous pollutants in air medium, dissolved and suspended solids in water medium, air and water quality modelling, introduction to software.  
Prerequisite(s): Civil Engineering 481.

**Civil Engineering 591**  
**H(3-1)**  
*Solid and Hazardous Waste Engineering*  
Integrated waste management, solid and hazardous waste characterization and classification, reduce, reuse, recycle, resource recovery and utilization, composting, thermal techniques of waste treatment, fundamentals of waste degradation and disposal, geo-environmental aspects of landfill design, leachate and gas management at landfills.  
Prerequisite(s): Civil Engineering 481.

**Civil Engineering 595**  
**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**  
**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 defined 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.

**Civil Engineering 599**  
**H(0-5)**  
*Civil Engineering Project II*  
Individual project intended for students who have completed a suitable Civil Engineering Individual Project and wish to continue the assigned research project by completing a more extensive investigation. A comprehensive written report is required which is defended and presented orally in a Department seminar.  
Prerequisite(s): Civil Engineering 597 and formal approval from the project supervisor and course coordinator(s).

**Graduate Courses**

**Civil Engineering 587**  
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 601**  
Q(32 hours)  
*Graduate Research Seminar*  
Reports on studies of the literature or of current research.  
MAY BE REPEATED FOR CREDIT NOT INCLUDED IN GPA

**Civil Engineering 611**  
**H(3-1)**  
*Bituminous Materials*  

**Civil Engineering 615**  
**H(3-0)**  
*Rheology of Engineering Materials*  

**Civil Engineering 617**  
**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**  
**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**  
**H(3-0)**  
*Computer Analysis of Structures*  

**Civil Engineering 623**  
**H(3-0)**  
*Behaviour and Design of Reinforced Concrete Members*  
Behaviour and strength of reinforced concrete members, methods of 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**  
**H(3-0)**  
*Serviceability of Concrete Structures: Advanced Topics*  

**Civil Engineering 629**  
**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**  
**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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Civil Engineering 635</td>
<td>Behaviour and Design of Prestressed Concrete Bridges and Other Structures</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 645</td>
<td>Risk Analysis</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 649</td>
<td>Structural Reliability Techniques</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 654</td>
<td>Finite Element Modelling</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 655</td>
<td>Numerical Methods for Modelling Geomaterials</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 665</td>
<td>Fundamentals of Soil Behaviour</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 667</td>
<td>Applied Rock Engineering</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 669</td>
<td>Advanced Foundation Engineering</td>
<td>H(4-0)</td>
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<tr>
<td>Civil Engineering 671</td>
<td>Constitutive Laws for Geomaterials</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 689</td>
<td>Advanced Project Management Practices and Principles</td>
<td>H(3-0)</td>
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</tbody>
</table>

**Courses of Instruction**

**Civil Engineering 635 H(3-0)**

**Behaviour and Design of Prestressed Concrete Bridges and Other Structures**


**Civil Engineering 637 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 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 H(3-0)**

**Seismic Analysis and Design**

Introduction to seismology, ground movements, typical accelerograms. 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 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):** Not open to students with credit in Civil Engineering 553 or 595.05.
Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Civil Engineering 691</td>
<td>(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.</td>
<td>H(3-0)</td>
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<tr>
<td>Civil Engineering 693</td>
<td>H(3-0)</td>
<td>Project Management Engineering 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.</td>
</tr>
<tr>
<td>Civil Engineering 695</td>
<td>H(3-0)</td>
<td>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; labor relations; claims; contractor responsibility in project commissioning, start-up and operations.</td>
</tr>
<tr>
<td>Civil Engineering 697</td>
<td>H(3-0)</td>
<td>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 labor relations.</td>
</tr>
<tr>
<td>Civil Engineering 699</td>
<td>H(3-0)</td>
<td>Law for Project Managers Legal issues related to the effective management of projects. Introduction to the legal system and processes; environmental law; intellectual property; nondisclosure; 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.</td>
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<tr>
<td>Note: This course may not be taken for credit towards the JD or LLM degrees.</td>
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<tr>
<td>Civil Engineering 703</td>
<td>H(3-0)</td>
<td>Fundamentals of ITS and Transportation System Performance Definition of ITS, with particular emphasis on advanced traffic management and control and advanced traveler information issues; traffic assignment and dynamic traffic assignment, traffic simulation tools; vot; planning traffic flow models; from microscopic to macroscopic traffic flow theory; traffic and incident management; traffic control; freeway control.</td>
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<tr>
<td>Civil Engineering 705</td>
<td>H(3-0)</td>
<td>Traffic Engineering Traffic stream characteristics, related field surveys; advanced probability distributions of headway, flow and lane spacing; peak, off-peak, platoon flow conditions; analysis of density contours; the generalized car-following model, related macro-models of traffic streams, practical applications; Traffic incident analysis; Two-lane highways; actuated and pre-timed traffic signals; two-way coordination of signals; introduction to network controls.</td>
</tr>
<tr>
<td>Civil Engineering 707</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Civil Engineering 709</td>
<td>H(2-4)</td>
<td>Practice of Transport Demand Modelling Sample enumeration modelling; practical aspects of logit model estimation and calibration; disaggregate choice behaviour data; practical 4-step transport demand modelling using conventional software packages; application of computer-based network assignment models.</td>
</tr>
<tr>
<td>Civil Engineering 711</td>
<td>H(3-0)</td>
<td>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 modeling of mode of operation, route alignment, access, station &amp; stop location, transfer protocols, time table, vehicle &amp; fleet size, reliability; concepts of utility and value of time; detailed functional design &amp; optimization of a bus route, rail line; bus, rail and metro networks.</td>
</tr>
<tr>
<td>Civil Engineering 713</td>
<td>H(3-1)</td>
<td>Mountain Highway Engineering Road vehicle performance in mountainous terrain; the slow moving vehicle problem; highway capacity and level of service; terrain classification; alignment elements, cross section elements, intersections, traffic barriers; planning and design of passing lanes, climbing lanes, truck escape ramps, turnouts, and low-volume roads; traffic management in avalanche zones; environmental impact of highways in mountainous terrain. Vehicle operating costs; engineering evaluation of mountain highway projects.</td>
</tr>
<tr>
<td>Civil Engineering 715</td>
<td>H(3-0)</td>
<td>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.</td>
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<tr>
<td>Note: Not open to students with credit in Civil Engineering 619.52 or 719.</td>
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<tr>
<td>Civil Engineering 741</td>
<td>H(3-0)</td>
<td>(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.</td>
</tr>
<tr>
<td>Civil Engineering 743</td>
<td>H(3-0)</td>
<td>(Environmental Engineering 625) Computational Methods for Environmental Engineering Taylor series, numerical integration. Linear and nonlinear 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.</td>
</tr>
</tbody>
</table>
Courses of Instruction

Civil Engineering 745  H(3-0)
(Industrial Engineering 655)

Hazardous Waste and Contaminated Sites Management

Note: Credit for both Civil Engineering 745 and Environmental Engineering 655 will not be allowed.

Civil Engineering 747  H(3-0)
(Industrial 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 vapor 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 both Civil Engineering 747 and Environmental Engineering 653 will not be allowed.

Civil Engineering 749  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 both Civil Engineering 749 and Environmental Engineering 651 will not be allowed.

Civil Engineering 751  H(3-0)

Snow Avalanche Dynamics and 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  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.
Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Notes</th>
<th>May Be Repeated for Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications Studies 711</td>
<td>H(3S-0)</td>
<td></td>
<td></td>
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<tr>
<td>Direct Studies</td>
<td>A research project under the direction of a faculty member.</td>
<td>Note: May be repeated for credit once.</td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Program Director.</td>
<td></td>
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</tr>
<tr>
<td>PhD Theory Seminar</td>
<td>A theory seminar that enables PhD students to focus their research interests and to explore theories that are relevant to their areas of specialization.</td>
<td>Prerequisite(s): Consent of the Program Director.</td>
<td></td>
</tr>
<tr>
<td>Communications Studies 713</td>
<td>H(3S-0)</td>
<td></td>
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</tr>
<tr>
<td>Selected Topics in Communication</td>
<td>A variety of communication topics based on faculty expertise.</td>
<td>Prerequisite(s): Consent of the Program Director.</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Communications Studies 790</td>
<td>F(0-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s Project</td>
<td>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.</td>
<td>Prerequisite(s): Consent of the Program Director.</td>
<td></td>
</tr>
</tbody>
</table>

### Community Health Sciences MDCH

#### Graduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Notes</th>
<th>May Be Repeated for Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Health Sciences 600</td>
<td>H(3-0) (formerly Medical Science 644)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Community Health Sciences</td>
<td>An introduction to the Department as well as a general orientation to the education and research programs in Community Health.</td>
<td>Note: Students must be registered in Community Health Sciences or Community Medicine Residency Program. This fall block week course is a requirement for all thesis-based MSc and PhD students entering graduate programs in the Department of Community Health Sciences.</td>
<td>NOT INCLUDED IN GPA</td>
</tr>
<tr>
<td>Community Health Sciences 601</td>
<td>H(3-0) (formerly Medical Science 642)</td>
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</tr>
<tr>
<td>Determinants of Health I</td>
<td>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.</td>
<td>Note: This winter block week course is a requirement for all thesis-based MSc and PhD students the Department of Community Health Sciences. Consent of instructor is required for all other students.</td>
<td></td>
</tr>
<tr>
<td>Community Health Sciences 602</td>
<td>H(1-0) (formerly Medical Science 649.01)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practicum in Community Medicine</td>
<td>Clinical or field-based practicum for the Master of Community Medicine program.</td>
<td>Note: Students must be registered in the Master of Community Medicine Program or the Community Medicine Residency program.</td>
<td></td>
</tr>
<tr>
<td>NOT INCLUDED IN GPA</td>
<td>Community Health Sciences 603</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Health Sciences 604</td>
<td>H(1-0) (formerly Medical Science 649.03)</td>
<td></td>
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</tr>
<tr>
<td>Practicum in Community Health Sciences</td>
<td>Clinical or field-based practicum for students in any specialization of the Community Health Sciences graduate program.</td>
<td>Note: Students must be registered in the Community Health Sciences graduate program.</td>
<td></td>
</tr>
<tr>
<td>NOT INCLUDED IN GPA</td>
<td>Community Health Sciences 605</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Health Sciences 610</td>
<td>H(3-2T) (formerly Medical Science 643.01)</td>
<td></td>
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</tr>
<tr>
<td>Biostatistics I: Essentials of Biostatistics</td>
<td>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.</td>
<td>Prerequisite(s): There are no formal prerequisites but good quantitative and mathematical skills are an asset.</td>
<td>Note: Enrolment is open to all Community Health Sciences graduate students and Community Medicine Residents. Consent of instructor is required for all other students. Not available to Open Studies students.</td>
</tr>
<tr>
<td>Community Health Sciences 611</td>
<td>H(3-2T) (formerly Medical Science 643.02)</td>
<td></td>
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</tr>
<tr>
<td>Biostatistics II: Models for Health Outcomes</td>
<td>Extends the fundamental concepts to modeling 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.</td>
<td>Prerequisite(s): Community Health Sciences 610 or Medical Science 643.01 or graduate-level course in biostatistics.</td>
<td>Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students. Not available to Open Studies students.</td>
</tr>
<tr>
<td>Community Health Sciences 612</td>
<td>H(3-2T) (formerly Medical Science 643.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biostatistics III: Models for Repeated Measures Studies and Time-to-Events Studies</td>
<td>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.</td>
<td>Prerequisite(s): Community Health Sciences 611 or Medical Science 643.02.</td>
<td>Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students. Not available to Open Studies students.</td>
</tr>
<tr>
<td>Community Health Sciences 640</td>
<td>H(3-2T)</td>
<td></td>
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</tr>
<tr>
<td>Fundamentals of Epidemiology</td>
<td>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 judgement in epidemiology are also introduced.</td>
<td>Prerequisite(s): Community Health Sciences 610 or Medical Science 647.01.</td>
<td>Note: Enrolment is open to all Community Health Sciences graduate students and Community Medicine Residents. Consent of instructor is required for all other students. Not available to Open Studies students.</td>
</tr>
</tbody>
</table>
Courses of Instruction

Community Health Sciences 641 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 643 H(3-0) (formerly Medical Science 647.07)
Research in Healthcare Epidemiology and Infection Control
Emphasizes the research aspects of hospital epidemiology and the application of basic epidemiologic and biostatistical techniques in the hospital environment. The course uses an interdisciplinary approach and fosters the integration of knowledge and skills from the bench to the bedside and back.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 644 H(3-0) (formerly Medical Science 647.10)
Surveillance I: Data Handling for Infection Control
Focuses on the needs 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students. This is an online course.

Community Health Sciences 645 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students. This is an online course.

Community Health Sciences 646 H(3-2T) (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.
Note: Enrolment is open to Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 647 H(3-0)
Clinical Epidemiology
Designed for students who have some familiarity with basic 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.
Note: Enrolment is open to Community Health Sciences graduate students with a clinical background. Consent of instructor is required for all other students.

Community Health Sciences 648 F(3-1.5) (formerly Medical Science 660)
On-line 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 develop practical solutions in Infection Control.
Note: Enrolment is open to Community Health Sciences graduate students. Consent of instructor is required for all other students. This is an online course.

Community Health Sciences 649 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 660 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 evaluation and analysis.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 661 H(3-0) (formerly Medical Science 679/Economics 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 662 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 663 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.
Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 664 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.
Courses of Instruction

Community Health Sciences 665  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 and management; 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.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 666  H(3-0)  (formerly Medical Science 645.15)

Health Policy: Policy Issues in the Canadian Health Care System
An advanced level course focused on developing and deepening participants’ understanding of critical policy issues affecting the management and delivery of health services. While the course will review health policy in the context of systems of care within Canada, 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.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 667  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 ethical-legal complexity of health care and health research in Canada.

Prerequisite(s): Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 680  H(3-0)  (formerly Medical Science 651.04)

Foundations of Population/Public Health
Foundations of Population and Public Health is an introductory course intended to acquaint students with the concepts, theories, methods, and debates that underpin population and public health research. The course covers a wide range of topics including the core functions and history of public health, critical debates in population and public health, and the methods for population health research (essentially social epidemiology and some political economy). The course format is a mix of formal lectures dealing with technical material, and class discussion based on pre-assigned readings. Students participate in discussions through a variety of media including on-line chats and discussion boards using Blackboard, as well as during class time.

Prerequisite(s): Community Health Sciences 601 or Medical Science 642.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 681  H(3-2T)  (formerly Medical Science 659.02)

Health Research Methods
Introduction to health research, including research design, measurement, data collection and proposal writing.

Prerequisite(s): Community Health Sciences 610 or Medical Science 643.01.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students. Not available to Open Studies students.

Community Health Sciences 682  H(3-0)  (formerly Medical Science 659.03)

Health Program Planning and Evaluation
Knowledge of the basic concepts, principles, facts and theories related to program evaluation. Class projects involve written application of knowledge in an actual program.

Prerequisite(s): Community Health Sciences 681 or Medical Science 659.02.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 683  H(6-0)  (formerly Medical Science 659.05)

Qualitative Health Research
Proposal development, interview skills and other data collection skills, data analysis, use of visual aids, and the preparation of final reports.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 684  H(3-0)  (formerly Medical Science 651.01)

Health Promotion Planning
Understanding and application of the literature and models. An emphasis on development of health promotion programs.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 685  H(3-0)  (formerly Medical Science 651.02)

Health Promotion with Women
Covers theories of population health promotion as they apply to women, and substantive health issues they face as a population (e.g., violence, mental health). Distance Learning offered jointly with the University of Alberta.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students. This is an online course.

Community Health Sciences 686  H(3-0)  (formerly Medical Science 651.05)

Determinants of Health II
Examination of psycho-socio-cultural factors in health, illness and health care, with a focus on emerging and current issues related to health and illness. Cross-cutting topics include: International perspectives and trends in health sector reform, globalization, policy development and financing, public participation in decision making, governance, health human resources, gender, human rights, partnerships and information-education-communication among others.

Note: Enrolment is open to all Community Health Sciences graduate students. Consent of instructor is required for all other students.

Community Health Sciences 700  H(1-6)

Community Health Directed Study
Independent study in special topics at an advanced level in Community Health Sciences.

Note: Consent of faculty member who will supervise the chosen study.

MAY BE REPEATED FOR CREDIT

Community Health Sciences 710  H(3-0)  (formerly Medical Science 712.01)

Advanced Topics in Biostatistics
Advanced topics and methods used in Biostatistics.

Prerequisite(s): Consent of instructor is required.

Community Health Sciences 720  H(2-3)

Pro Doctoral Seminar
Pertinent topics discussed to prepare students for thesis preparation.
### Community Health Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Community Health Sciences 740</td>
<td>(formerly Medical Science 709)</td>
<td>H(3-2T) Advanced Epidemiology</td>
</tr>
<tr>
<td>Systematic Reviews and Meta-Analysis</td>
<td>Community Health Sciences 741</td>
<td>H(3-0) Systematic Reviews and Meta-Analysis</td>
</tr>
</tbody>
</table>
| Community Rehabilitation CORE | Community Health Sciences 742 | H(3-0) Community Rehabilitation CORE | Instruction offered by members of the Community Rehabilitation and Disability Studies interdisciplinary team. **Director:** E. A. Hughson **Graduate Courses** | Community Rehabilitation 601 | Q(1-1) Community Rehabilitation 601

#### Advanced Topics in Population/Public Health

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Health Sciences 760</td>
<td>(formerly Medical Science 712.03)</td>
<td>H(3-0) Advanced Topics in Epidemiology</td>
</tr>
<tr>
<td>Community Health Sciences 761</td>
<td>(formerly Medical Science 705)</td>
<td>H(3-0) Advanced Methods in Health Research</td>
</tr>
<tr>
<td>Community Health Sciences 780</td>
<td>(formerly Medical Science 712.04)</td>
<td>H(3-0) Advanced Topics in Population/Public Health</td>
</tr>
<tr>
<td>Community Health Sciences 640</td>
<td></td>
<td>H(3-0) Foundations of Multi-Agent Systems</td>
</tr>
<tr>
<td>Computer Science 605</td>
<td>(Medical Science 605)</td>
<td>H(3-0) Computer Science CPSC</td>
</tr>
<tr>
<td>Computer Science 609</td>
<td>H(3-0) Foundations of Multi-Agent Systems</td>
<td>Modelling of agents and properties of multi-agent systems. Communication issues, including interaction and coordination concepts, forming and maintaining organizations, and competitive agent environments. Example systems: the implementation of a multi-agent system will be performed as the assignment. <strong>Antirequisite(s):</strong> Credit for both Computer Science 609 and Software Engineering 697 will not be allowed for programs offered by the Department of Computer Science.</td>
</tr>
<tr>
<td>Community Science 610</td>
<td>H(3-0) Computer Science CPSC</td>
<td><strong>Compiler Code Generation and Optimization</strong></td>
</tr>
<tr>
<td>Computer Science 611</td>
<td>H(3-0) Complexity Theory</td>
<td>Deterministic and non-deterministic time and space complexity; complexity classes and hierarchies; NP-complete problems and intractable problems; axiomatic complexity theory. <strong>Note:</strong> Computer Science 413 or equivalent is recommended as preparation for this course.</td>
</tr>
</tbody>
</table>
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 613</td>
<td>Program Specification, Proof and Transformation</td>
<td>H(3-0)</td>
<td>Program proving techniques; approaches to partial and total correctness. Operational abstraction and data abstraction. Mechanical transformation of programs. Machine assisted proof. Note: Computer Science 521 or equivalent is recommended as preparation for this course.</td>
</tr>
<tr>
<td>Computer Science 617</td>
<td>Category Theory for Computer Science</td>
<td>H(3-0)</td>
<td>Introduction to category theory with applications in computer science. Functions, 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.</td>
</tr>
<tr>
<td>Computer Science 619</td>
<td>Quantum Computation</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 622</td>
<td>Randomized Algorithms</td>
<td>H(3-0)</td>
<td>(formerly Computer Science 601.60) Design and analysis of randomized algorithms; discrete probability theory; randomized data structures; lower bound techniques; randomized complexity classes; advanced algorithmic applica-tions from various areas.</td>
</tr>
<tr>
<td>Computer Science 625</td>
<td>Principles of Computer Security</td>
<td>H(3-0)</td>
<td>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 modeling of protection systems, discretionary access control, safety analysis, information flow control, integrity, role-based access control. Legal and ethical considerations will be necessary. Note: Computer Science 457 and Mathematics 271, or equivalents, are recommended as preparation for this course.</td>
</tr>
<tr>
<td>Computer Science 626</td>
<td>Network Systems Security</td>
<td>H(3-0)</td>
<td>Attacks on networked systems, tools and techniques for detection and protection against attacks including firewalls and intrusion detection and prevention 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.</td>
</tr>
<tr>
<td>Computer Science 627</td>
<td>Computer Viruses and Malware</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 628</td>
<td>Spam and Spyware</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 629</td>
<td>Elliptic Curves and Cryptography</td>
<td>H(3-0)</td>
<td>(Pure Mathematics 629) 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 Gam-al 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.</td>
</tr>
<tr>
<td>Computer Science 630</td>
<td>Information Theoretic Security</td>
<td>H(3-0)</td>
<td>Information theoretic concepts such as entropy, mutual information and statistical distance, and their applications to information security systems. Note: One of Computer Science 219, 233 or 235 and one of Mathematics 271, 273 or Pure Mathematics 315 and one of Statistics 211 or Mathematics 321, or equivalents, are recommended as preparation for this course.</td>
</tr>
<tr>
<td>Computer Science 641</td>
<td>Performance Issues in High Speed Networks</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 643</td>
<td>Modern Wireless Networks</td>
<td>H(3-0)</td>
<td>(formerly Computer Science 601.37) An introduction to the fundamentals and applications of wireless networks.</td>
</tr>
<tr>
<td>Computer Science 653</td>
<td>Computational Geometry</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 661</td>
<td>Algorithms for Distributed Computation</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 662</td>
<td>Agent Communications</td>
<td>H(3-0)</td>
<td>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. Note:</td>
</tr>
<tr>
<td>Computer Science 667</td>
<td>Computer Algebra</td>
<td>H(3-0)</td>
<td>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.</td>
</tr>
<tr>
<td>Computer Science 669</td>
<td>Cryptography</td>
<td>H(3-0)</td>
<td>(Pure Mathematics 669) 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.</td>
</tr>
<tr>
<td>Computer Science 671</td>
<td>Database Management Systems</td>
<td>H(3-0)</td>
<td>Foundations of database applications and database systems, plus some advanced topics in data management systems will be introduced.</td>
</tr>
<tr>
<td>Computer Science 673</td>
<td>Distributed Database Systems</td>
<td>H(3-0)</td>
<td>Introduction to distributed database systems. Topics covered include: architecture, data design, query processing, transaction management, multitudes, object-oriented databases and advanced system issues.</td>
</tr>
</tbody>
</table>
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 675</td>
<td>Datawarehouse Systems</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 681</td>
<td>Research Methods in Human-Computer Interaction</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 683</td>
<td>Information Visualization: Theory and Practice</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 687</td>
<td>Computer Animation</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 689</td>
<td>Modelling for Computer Graphics</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 691</td>
<td>Rendering</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 695</td>
<td>Advanced Geometric Algorithms in Information Systems</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 696</td>
<td>Information Security Seminar</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 698</td>
<td>Biometric Technologies</td>
<td>F(3-0)</td>
</tr>
<tr>
<td>Computer Science 699</td>
<td>Research Methodology in Computer Science</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 701</td>
<td>Advanced Topics in Multiagent Systems</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 707</td>
<td>Research Topics in Computer Science</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 711</td>
<td>Current Trends in Database Technology</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 715</td>
<td>Advanced Geometric Modelling</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 767</td>
<td>Implicit Modelling</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 771</td>
<td>Biometric Technologies</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 781</td>
<td>Advanced Topics in Human-Computer Interaction</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Computer Science 785</td>
<td>Implicit Modelling</td>
<td>H(3-0)</td>
</tr>
</tbody>
</table>

### Continuing Education CTED

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing Education 693</td>
<td>Master's Project I</td>
<td>H(3-0)</td>
</tr>
</tbody>
</table>

### Graduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing Education 693</td>
<td>Master's Project I</td>
<td>H(3-0)</td>
</tr>
</tbody>
</table>

### Master's Project I

The project could involve an in-depth scholarly study, using secondary sources, of a chosen area of workplace learning. Alternatively, it could involve case study analysis of a specific workplace issue or problem. The project will enable the adult learner to develop and demonstrate competence in conducting an investigation at an organizational level. This phase of the master's project typically involves the preparation and approval of a research proposal and an ethics application, if the research involves human subjects.

**Prerequisite(s):** Consent of the Faculty.

**Note:** Open only to students in the MCE degree program. This course will involve the student, in consultation with his/her supervisor, selecting a research issue, problem or question to be examined, writing a project proposal outlining the guidelines for conducting the research and, if involving human subjects, obtaining approval from the Research Ethics Board.

**NOT INCLUDED IN GPA**
Courses of Instruction

Continuing Education 695  H(3-0)

Master's Project II
This phase involves the written portion of the master’s project.
Prerequisite(s): Continuing Education 693.
Note: Open only to students in the MCE degree program.
NOT INCLUDED IN GPA

Culture and Society CUSP
Instruction offered by the Department of Communication and Culture in the Faculty of Arts.

Graduate Courses
Note: Courses that are considered electives will be offered on the basis of student needs and contingent upon the availability of staff resources.

Culture and Society 601  H(3S-0)

Interdisciplinary Approaches to Culture and Society
An introduction to ways of studying culture and society from a variety of perspectives, including those rooted in traditional disciplines and more interdisciplinary approaches such as cultural studies and critical discourse analysis. Specific problems in culture and society will provide the basis for course work.
Prerequisite(s): Consent of the Program Director.

Culture and Society 603  H(3S-0)

Heritage and Identity – Issues and Approaches
An investigation of various issues related to defining and portraying cultural heritage, ethnic identity, and history within the public sphere and how governments, special interest groups, heritage organizations and institutions, and the mass media shape public perceptions of national and regional identity, ethnicity and history.
Prerequisite(s): Consent of the Program Director.

Culture and Society 605  H(3S-0)

Approaches to Development Theory and Praxis
Critical historical processes of development within a global context, competing theoretical and methodological paradigms for evaluating those processes, and their implications for the praxis of development in both the Global North and South.
Prerequisite(s): Consent of the Program Director.

Culture and Society 607  H(3S-0)

Social and Global Justice
A critical overview of the meaning and implementation of social justice by examining key legal, social and political theories as well as the history of Canadian and international social justice movements.
Prerequisite(s): Consent of the Program Director.

Culture and Society 613  H(3S-0)

Cultural and Social Theory
An examination of a wide range of critical social theories, including feminist theory, critical race theory and postcolonial theory, will provide students with the analytical sophistication and critical thinking skills necessary to unpack complex cultural and social dynamics and to develop innovative approaches to vexing issues.
Prerequisite(s): Consent of the Program Director.

Culture and Society 615  H(3S-0)

Research Methods
A survey of research methods appropriate to the study of communication and culture.
Prerequisite(s): Consent of the Program Director.

Culture and Society 711  H(3S-0)

Directed Studies
A research project under the direction of a Faculty member.
Prerequisite(s): Consent of the Program Director.
Note: May be repeated for credit once.
MAY BE REPEATED FOR CREDIT

Culture and Society 713  H(3S-0)

PhD Theory Seminar
A theory seminar than enables PhD students to focus their research interests and to explore theories that are relevant to their areas of specialization.
Prerequisite(s): Consent of the Program Director.
Note: Open only to PhD students in Communications Studies and Culture and Society.
MAY BE REPEATED FOR CREDIT

Culture and Society 717  H(3S-0)

Selected Topics in Culture and Society
A variety of topics based on faculty expertise.
Prerequisite(s): Consent of the Program Director.
MAY BE REPEATED FOR CREDIT

Dance DNCE
Instruction offered by members of the Department of Dance in the Faculty of Arts. An audition and consent of the Department of Dance is necessary before students register in certain courses.
Department Head – A. Mouat

Graduate Courses

Dance 681  H(2S-2)

Special Topics in Dance
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Drama DRAM
Instruction offered by members of the Department of Drama in the Faculty of Fine Arts.
Department Head - C. Martini

Undergraduate Courses

Drama 517  H(2S-2)

Advanced Design for Theatre I
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 Department.

Drama 519  H(2S-2)

Advanced Design for Theatre II
Continuation of Drama 517.
Prerequisite(s): Drama 517 and consent of the Department.

Drama 531  H(2S-2)

Scene Painting I
Theory and technique of scene painting for a variety of theatre genres.
Prerequisite(s): Consent of the Department.

Drama 533  H(2S-2)

Scene Painting II
Continuation of theory and technique of scene painting for a variety of theatre genres.
Prerequisite(s): Drama 531 and consent of the Department.

Drama 540  F(4S-0)

Seminar in Drama III
Critical study at an advanced level of the dramatic metaphor as presented in the Department’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 or consent of the Department.

Drama 560  F(2S-2)

Performance Creation III
Independent research, creation and facilitation of original solo or group performances.
Prerequisite(s): Drama 460 or consent of the Department.

Drama 564  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 460 or consent of the Department.

Drama 571  H(2S-0)

Directed Studies I
MAY BE REPEATED FOR CREDIT

Drama 572  F(2S-0)

Directed Studies II
Prerequisite(s): Consent of the Department.
MAY BE REPEATED FOR CREDIT

Drama 590  F(1S-10)

Professional Theatre Internship
Internship experience in acting; directing; design; dramaturgy; theatre, stage or production management with a local professional theatre organization.
Prerequisite(s): Four-year standing and consent of the Department.

Graduate Courses

Drama 605  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  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.
Courses of Instruction

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drama 610</td>
<td>F(2S-3)</td>
<td>F(2S-3)</td>
</tr>
<tr>
<td>Selected Problems in Directing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drama 623</td>
<td>H(2S-2)</td>
<td>H(2S-2)</td>
</tr>
<tr>
<td>Seminar in Scene Design</td>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
</tr>
<tr>
<td>Drama 625</td>
<td>H(2S-2)</td>
<td>H(2S-2)</td>
</tr>
<tr>
<td>Seminar in Costume Design</td>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
</tr>
<tr>
<td>Drama 627</td>
<td>H(2S-2)</td>
<td>H(2S-2)</td>
</tr>
<tr>
<td>Seminar in Lighting Design</td>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
</tr>
<tr>
<td>Drama 629</td>
<td>H(2S-2)</td>
<td>H(2S-2)</td>
</tr>
<tr>
<td>Seminar in Technical Direction</td>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
</tr>
<tr>
<td>Drama 647</td>
<td>H(3S-0)</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Studies in Modern Drama I</td>
<td></td>
<td></td>
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<tr>
<td>Studies in Modern Drama II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drama 649</td>
<td>H(3S-0)</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Directed Studies</td>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
</tr>
<tr>
<td>Drama 660</td>
<td>F(2S-3)</td>
<td>F(2S-3)</td>
</tr>
<tr>
<td>Seminar and Practicum in Performance Creation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drama 671</td>
<td>H(3S-0)</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Selected Problems in Playwriting I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drama 673</td>
<td>H(3S-0)</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Selected Problems in Playwriting II</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ecology ECOL

Instruction offered by members of the Department of Biological Sciences in the Faculty of Science.
Department Head - R.M.R. Barclay

Undergraduate Courses

Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599.

Ecology 501                                      | 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 417, 425, 429 and completion of at least 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 527                                      | 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.

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.

Ecology 603                                      | 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                                      | H(0-6)  |            |

Limnology and Oceanography

Lectures, seminars and projects in the areas of limnology, aquatic ecology and oceanography.

Ecology 677                                      | 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                                      | 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.
Department Head – C. Bruce

Graduate Courses

Students are required to have departmental consent before registering in any of the following courses:

Economics 605                                    | H(3-0)  |            |

Advanced Computational Optimization and Economic Applications I

Economics 607                                    | H(3-0)  |            |

Advanced Computational Optimization and Economic Applications II

Prerequisite(s): Economics 605.

Economics 611                                    | H(3-0)  |            |

Independent Study

MAY BE REPEATED FOR CREDIT

Economics 615                                    | H(3-0)  |            |

Advanced Econometrics I

The study of the interrelated but conceptually distinct problems of identification and statistical inference in the context of economically interesting applications. The identification “problem” in economics is the problem of characterizing parameters of an econometric model from innumerable observable data, while statistical inference is the practice of using statistical tools to draw conclusions about the parameters of the model given finite observable data.

Economics 617                                    | H(3-0)  |            |

Advanced Econometrics II

Prerequisite(s): Economics 615 or consent of the Department.

Economics 619                                    | H(3-0)  |            |

Economics of International Commercial Policy

Examines important longstanding as well as contemporary issues from the economic literature on international trade. This course focuses on quantitative and empirical analysis. Specific topics typically covered are 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                                    | 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 625                                    | H(3-0)  |            |

The Economics of the Petroleum Industry
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics 627</td>
<td>Energy in the Production Sector of the Economy</td>
</tr>
<tr>
<td></td>
<td>The object is to teach students to use the tools of microeconomic analysis, institutional economics, and econometrics, to understand energy markets. There will be a focus on empirical studies of the energy business including (but not limited to) natural gas markets, crude oil markets, gasoline markets, electricity markets, coal markets, and public policies affecting energy markets.</td>
</tr>
<tr>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Economics 633</td>
<td>Labour Markets</td>
</tr>
<tr>
<td></td>
<td>A study of aspects of labour markets using both microeconomic theory and empirical evidence. Focus will be on the econometric methods of analysis that are currently applied beyond the traditional boundaries of labour economics into public economics, the economics of crime, the economics of education, the economics of immigration, etc.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Economics 641</td>
<td>Financial Economics</td>
</tr>
<tr>
<td></td>
<td>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 modeling and prediction of financial data.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Economics 643</td>
<td>Institutions and Growth</td>
</tr>
<tr>
<td></td>
<td>A focus on how institutions influence macroeconomic outcomes. The main objective is to understand the role of economic, social and political institutions in economic backwardness and development.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Economics 645</td>
<td>Topics on Institutions and Economic Performance</td>
</tr>
<tr>
<td></td>
<td>A focus on the role of economic, social and political institutions in economic backwardness and development.</td>
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<tr>
<td>H(3-0)</td>
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<tr>
<td>Economics 651</td>
<td>(formerly Economics 611.13)</td>
</tr>
<tr>
<td></td>
<td>Redistribution and Social Insurance</td>
</tr>
<tr>
<td></td>
<td>A focus on the role of economic, social and political institutions in economic backwardness and development.</td>
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<tr>
<td>H(3-0)</td>
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<tr>
<td>Economics 653</td>
<td>Public Revenue Analysis</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Economics 655</td>
<td>Cost/Benefit Analysis</td>
</tr>
<tr>
<td></td>
<td>Theoretical and applied aspects of the use of cost-benefit techniques and applied welfare analysis in the evaluation of investment projects and public policies.</td>
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<tr>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Economics 657</td>
<td>Microeconomic Theory</td>
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<tr>
<td></td>
<td>Introduction to advanced microeconomic theory. Standard topics include consumer theory, theory of the firm, and general equilibrium.</td>
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<tr>
<td>H(3-0)</td>
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<tr>
<td>Economics 659</td>
<td>Macroeconomic Theory</td>
</tr>
<tr>
<td></td>
<td>Introduction to the basic structure of the dynamic general equilibrium framework that forms the backbone of most modern macroeconomics research. It also covers a number of selected topics such as economic growth, income inequality, inflation and unemployment.</td>
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<tr>
<td>H(3-0)</td>
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<tr>
<td>Economics 661</td>
<td>Behavioural Economics</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Economics 663</td>
<td>Experimental Economics</td>
</tr>
<tr>
<td></td>
<td>The basics of using laboratory as a tool to test economic models.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Economics 667</td>
<td>Seminar in Industrial Organization</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Economics 675</td>
<td>Advanced Topics in Natural Resource Economics</td>
</tr>
<tr>
<td></td>
<td>Examines economic models of the structure and nature of natural resource industries and their interaction with the rest of the economy. Studied are non-renewable and renewable resources and applies methods from capital theory, growth theory, public economics, and industrial organization to the study of natural resources.</td>
</tr>
<tr>
<td>H(3-0)</td>
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<tr>
<td>Economics 677</td>
<td>Seminar in Economics of the Environment</td>
</tr>
<tr>
<td></td>
<td>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, economic growth and the environment, biodiversity, global warming and international environmental treaties.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Economics 681</td>
<td>Health Economics I</td>
</tr>
<tr>
<td></td>
<td>An overview of topics in health economics. An introduction to economic principles and techniques which are of use in analyzing and planning health policy, in particular the delivery of health services, and for understanding the health behaviour of individuals.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Health Economics II</td>
<td>A general introduction to current research in the economics of health and medical care, geared to students with significant research interests related with these fields. Content of the course will be tailored to these interests. Topics such as: the Demand for Health and the Production of Health; Patient Behaviour and Insurance; Physician-Induced Demand and Target Income; Physician Agency; Not-for-profit and For-profit Hospital; Hospital Competition will be included.</td>
</tr>
<tr>
<td>Q(3-0)</td>
<td></td>
</tr>
<tr>
<td>Economics 691</td>
<td>Research Methods I</td>
</tr>
<tr>
<td></td>
<td>Survey of research methods in economics. For course-based MA students.</td>
</tr>
<tr>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Economics 693</td>
<td>Research Methods III</td>
</tr>
<tr>
<td></td>
<td>Survey of research methods in economics. For course-based MA students.</td>
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<td>H(3-0)</td>
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<tr>
<td>Economics 695</td>
<td>Health Economics III</td>
</tr>
<tr>
<td></td>
<td>MAY BE REPEATED FOR CREDIT</td>
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<tr>
<td>Economics 711</td>
<td>Independent Study</td>
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<tr>
<td>Economics 757</td>
<td>Advanced Topics in Econometrics</td>
</tr>
<tr>
<td></td>
<td>A survey of selected topics in modern applied microeconomics. Recent developments in instrumental variables methods, methods to estimate treatment effects, notions of local causal effects, endogenous switching regressions, are among the topics that may be covered.</td>
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<tr>
<td>H(3-0)</td>
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<tr>
<td>Economics 759</td>
<td>Advanced Macroeconomic Theory</td>
</tr>
<tr>
<td></td>
<td>Building on Economics 657, 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.</td>
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<td>H(3-0)</td>
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<tr>
<td>Economics 795</td>
<td>Advanced Topics in Econometrics</td>
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<td></td>
<td>A survey of the ideas, controversies, and techniques that constitute modern macroeconomics. The principal issues it covers lie at the heart of such important social problems as inflation, deficits and debts, and economic growth. The empirical study of many issues raised in theoretical and political debates is also emphasized. 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, of course, conditional upon the availability of staff resources.</td>
</tr>
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<td>H(3-0)</td>
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</tbody>
</table>
### Courses of Instruction

**Educational Research EDER**

Instruction offered by members of the Graduate Division of Educational Research.

Associate Dean (Interim) – P. Patterson

### Graduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Research 603</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td><strong>Research Methods</strong></td>
<td>Introduction to various approaches to research in education.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</tr>
<tr>
<td>Educational Research 605</td>
<td>Q(1.5-0)</td>
<td></td>
</tr>
<tr>
<td>Special Topics in Professional Development</td>
<td>Consult Schedule of Classes for offerings.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 606</td>
<td>F(3-0)</td>
<td></td>
</tr>
<tr>
<td>Special Topics in Professional Development</td>
<td>Consult Schedule of Classes for offerings.</td>
<td></td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 607</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Special Topics in Professional Development</td>
<td>Consult Schedule of Classes for offerings.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 609</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Research Methods</strong></td>
<td>Various approaches to research in education.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 611</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Communication in Educational Administration</td>
<td>To explore dominant areas of interpersonal communication which constantly challenge educational leaders.</td>
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<tr>
<td>Educational Research 613</td>
<td>H(3-0)</td>
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<tr>
<td>Change and Innovation in Education</td>
<td>Human organization as the setting for the delivery of educational services.</td>
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<tr>
<td>Educational Research 617</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Organizational Theory and Analysis in Education</td>
<td>Consult Schedule of Classes for offerings.</td>
<td></td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 619</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Special Topics in Educational Leadership</td>
<td>Consult Schedule of Classes for offerings.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
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<tr>
<td>Educational Research 621</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Assessment of Classroom Learning</td>
<td>Examines both traditional and emerging assessment techniques, including Performance Assessment and Learning Portfolios, for examining students' learning outcomes.</td>
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<tr>
<td>Educational Research 623</td>
<td>H(3-2)</td>
<td></td>
</tr>
<tr>
<td>Topics in Educational Technology</td>
<td>Topics and issues in educational technology.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 625</td>
<td>H(3-0)</td>
<td></td>
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<tr>
<td><strong>Teacher Evaluation</strong></td>
<td>Examines both traditional and emerging techniques, e.g., Portfolios, for assessing teacher performance.</td>
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<tr>
<td>Educational Research 627</td>
<td>H(3-0)</td>
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<tr>
<td><strong>Program Evaluation</strong></td>
<td>Systematically examines the evaluation enterprise including concepts, procedures and uses of evaluation.</td>
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<tr>
<td>Educational Research 629</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Special Topics in Assessment/Evaluation</td>
<td>Consult Schedule of Classes for offerings.</td>
<td></td>
</tr>
<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
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<tr>
<td>Educational Research 631</td>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Special Topics in Workplace and Adult Learning</td>
<td>Examines topics in Workplace and Adult Learning.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 641</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Research on the Reading Process</td>
<td>Examination and criticism of competing theoretical discourses about the teaching and learning of reading in the elementary school.</td>
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<tr>
<td>Educational Research 649</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Special Topics in English Language Education</td>
<td>MAY BE REPEATED FOR CREDIT</td>
<td></td>
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<tr>
<td>Educational Research 651</td>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Philosophy of Education</td>
<td>Philosophical topics in the context of education.</td>
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<tr>
<td>Educational Research 653</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Sociology of Education</td>
<td>Consult Schedule of Classes for offerings.</td>
<td></td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
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<tr>
<td>Educational Research 655</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Comparative Education</td>
<td>Consult Schedule of Classes for offerings.</td>
<td></td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 657</td>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Culture and Gender Studies</td>
<td>Consult Schedule of Classes for offerings.</td>
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<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 659</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>History of Education</td>
<td>Historical topics in the context of education.</td>
<td></td>
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<tr>
<td>Educational Research 667</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Second Language Reading and Writing</td>
<td>Research and practice in second language reading and writing; instructional techniques for specific audiences; theories of reading and writing.</td>
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<tr>
<td>Educational Research 669</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Aspects of Second Language and Culture</td>
<td>Introduction to research and issues on various aspects of second language and culture.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 671</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Conceptualizing Educational Technology</td>
<td>Seminar to familiarize students with the terrain of educational technology.</td>
<td></td>
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<tr>
<td>Educational Research 673</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Instructional Design</td>
<td>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.</td>
<td></td>
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<tr>
<td>Educational Research 675</td>
<td>H(3-0)</td>
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<tr>
<td>Principles of Instructional Development</td>
<td>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.</td>
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<tr>
<td>Educational Research 677</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Distributed Learning</td>
<td>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.</td>
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<tr>
<td>Educational Research 679</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Special Topics in Educational Technology</td>
<td>Examination of current topics and issues in educational technology and related areas.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Educational Research 681</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Studying Curriculum</td>
<td>Curriculum research, theory, and practice with particular reference to curriculum aims, content, organization and change.</td>
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<tr>
<td>Educational Research 683</td>
<td>H(3-0)</td>
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<tr>
<td>Curriculum Development, Implementation and Assessment</td>
<td>Making sense of what happens when curriculum policy becomes reality and affects students, teachers, parents and politicians.</td>
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<tr>
<td>Educational Research 685</td>
<td>H(3-0)</td>
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<tr>
<td>Interpretive Curriculum Discourses</td>
<td>The field of interpretive work in curriculum theory.</td>
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<tr>
<td>Educational Research 689</td>
<td>H(3-0)</td>
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</tr>
<tr>
<td>Aspects of School Curriculum</td>
<td>Introductory systematic study of research and issues focused on various areas of the school curriculum.</td>
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<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td>Course Code</td>
<td>Title</td>
<td>Credits</td>
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<tr>
<td>Educational Research 690</td>
<td>F(3-0) <strong>Professional Project</strong> Seminar course to facilitate the preparation and evaluation of an independent culminating project.</td>
<td></td>
</tr>
<tr>
<td>Educational Research 691</td>
<td>H(3-0) <strong>Critical Issues in Education</strong> Culminating course focusing on the integration and application of major themes covered in student’s program.</td>
<td></td>
</tr>
<tr>
<td>Educational Research 693</td>
<td>H(3-0) <strong>Interpretive Study of Curriculum</strong> Introduction to the various forms of educational inquiry.</td>
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</tr>
<tr>
<td>Educational Research 695</td>
<td>H(3-0) <strong>Inquiry into Culture, History, Language and Cognition</strong> Examination of the foundations of interpretive studies.</td>
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<tr>
<td>Educational Research 697</td>
<td>Q(1.5-0) <strong>Special Topics</strong></td>
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</tr>
<tr>
<td>Educational Research 698</td>
<td>F(3-0) <strong>Advanced Research Methods</strong> Advanced study in the conduct of research.</td>
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</tr>
<tr>
<td>Educational Research 700</td>
<td>F(3-0) <strong>Seminar for First-Year PhD/EdD Students</strong> Seminar on selected topics.</td>
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<tr>
<td>Educational Research 701</td>
<td>H(3-0) <strong>Advanced Research Methods</strong></td>
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<tr>
<td>Educational Research 703</td>
<td>H(3-0) <strong>Directed Study</strong> Individual doctoral study in a selected area.</td>
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<tr>
<td>Educational Research 705</td>
<td>H(3-0) <strong>Doctoral Seminar in Educational Leadership</strong> Provides doctoral students with a contemporary Canadian focus on significant issues in educational leadership.</td>
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</tr>
<tr>
<td>Educational Research 719</td>
<td>H(3-0) <strong>Advanced Special Topics in Educational Leadership</strong> Consent of Graduate Programs in Education.</td>
<td></td>
</tr>
<tr>
<td>Educational Research 733</td>
<td>H(3-0) <strong>Advanced Workplace and Adult Learning</strong> Advanced exploration of diverse topics in workplace and adult learning.</td>
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</tr>
<tr>
<td>Educational Research 741</td>
<td>H(3-0) <strong>Advanced Seminar in Theory and Research in Literacy Education</strong> A critical examination of theories, models, and research that underpin literacy education.</td>
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</tr>
<tr>
<td>Educational Research 761</td>
<td>H(3-0) <strong>Research Seminar on Second Language Education</strong> Multidimensional perspectives on theory building about second language learning and teaching, including factors such as language, schooling, curriculum, culture, community and society.</td>
<td></td>
</tr>
<tr>
<td>Educational Research 771</td>
<td>H(3-0) <strong>Doctoral Seminar in Educational Technology</strong> Advanced doctoral seminar focused on defining issues and current research in educational technology.</td>
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</tr>
<tr>
<td>Educational Research 779</td>
<td>H(3-0) <strong>Advanced Educational Technology</strong> Advanced concepts in educational technology.</td>
<td></td>
</tr>
<tr>
<td>Educational Research 781</td>
<td>H(3-0) <strong>Conceptualizing Curriculum Research</strong> Analysis of different approaches to curriculum research, especially assumptions, meaning frameworks, and views of the theory/practice relationship.</td>
<td></td>
</tr>
<tr>
<td>Educational Research 785</td>
<td>H(3-0) <strong>Advanced Study of Interpretive Curriculum Discourses</strong> An advanced study of interpretive curriculum discourses focussing on cutting-edge examples of such work.</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Engineering ENEL**

**Instruction offered by members of the Department of Electrical and Computer Engineering in the Schulich School of Engineering.**

- **Department Head**: W. Rosehart
- **Associate Heads**: M. Potter (Undergraduate), D. Westwick (Graduate)

- **Director of Undergraduate Program for Electrical and Computer Engineering**: N. Bartley
- **Director of Undergraduate Program for Software Engineering**: M. Moussavi

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**Undergraduate Courses**

**Electrical Engineering 519** H(3-2)

**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** H(3-2)

**Neuro-Fuzzy and Soft Computing** Neural networks: neuron models and network architectures; perceptrons; 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 527** H(3-2)

**Design and Implementation of FPGA-Based DSP Systems**

The design and implementation of digital systems for digital signal processing applications. Introduction to Hardware Design Languages. VHDL. Intro-
duction to digital filter design and computational units for digital arithmetic, interface standards. Interfacing to peripheral devices. Printed circuit board design and implementation. Design for testability.

Prerequisite(s): Electrical Engineering 453 and 471.

Electrical Engineering 529 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 Biomedical Engineering 319 or Engineering 319 or Electrical Engineering 419.

Electrical Engineering 541 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 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 465 or 469 and 471.

Electrical Engineering 563 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 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 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 465 or 469 and Computer Engineering 467.

Antirequisite(s): Credit for both Electrical Engineering 567 and 519.47 will not be allowed.

Electrical Engineering 569 H(3-1T-3/2)

Electronics for Instrumentation

Prerequisite(s): Electrical Engineering 465 or 469.

Electrical Engineering 571 H(1-1.5/2)

Digital Communications
Fundamentals of digital communication systems. Digital coding of analog waveforms; digital pulse modulation, pulse code modulation, delta modulation, intersymbol interference; baseband transmission, correlation coding. Probability theory. Optimal demodulation of data transmission; matched filtering; bit error rate.

Prerequisite(s): Electrical Engineering 471 and one of Biomedical Engineering 319, or Engineering 319 or Electrical Engineering 419.

Electrical Engineering 573 H(3-1T-1)

Telecommunications and Computer Communications
Fundamentals of telecommunication system and teletypewriter engineering; transmission systems; switching networks and congestions. Characterization of teletypewriter; queueing theory; mathematical modeling of queueing systems; the birth and death process. Erlang loss and delay formulas; Engset loss and delay formulas. Computer communication networks; multiple access techniques.

Prerequisite(s): Biomedical Engineering 319 or Engineering 319 or Electrical Engineering 419.

Electrical Engineering 575 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 577 H(3-1T-1)

Transmission Media

Prerequisite(s): Electrical Engineering 471 and 475.

Electrical Engineering 581 H(3-1T-3/2)

Renewable Energy & Solid State Lighting for Human Development
Introduction to solid state lighting (SSL) and renewable energy (RE) systems. Topics include: history of lighting, illumination standards, incandescent bulbs, fluorescent tubes, White LEDs their properties and measurement; photovoltaic, wind power, hydro power, human and animal power, thermoelectric, biomass energy, biodiesel, fuel cells and SSL system design. SSL project planning and financing, environmental and social impact assessments, carbon credits and SSL system metrics for the developing world.

Prerequisite(s): Electrical Engineering 489 or permission of the instructor.

Antirequisite(s): Credit for both Electrical Engineering 581 and 519.39 will not be allowed.

Electrical Engineering 583 H(2-4)

Fourth Year Computer, Electrical, and Software Engineering Team Design Project, Part A
Preliminary and detailed engineering design of a system with the emphasis on the design process as it is associated with electrical, computer and software engineering. Topics include design methodology and general design principles for engineers, and project management. The team-based design project may be sponsored by industry or the department.

Prerequisite(s): Electrical Engineering 107.

Electrical Engineering 585 H(3-2/2)

Introduction to Power Electronics

Prerequisite(s): Electrical Engineering 465 or 469.

Electrical Engineering 587 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 589 H(2-4)

Fourth Year Computer, Electrical, and Software Engineering Team Design Project, Part B
Continues upon the foundations of theory, experience and practice established in Part A.

Prerequisite(s): Electrical Engineering 583.

Note: Electrical Engineering 107, 583 and 589 are a required three-course sequence that shall be completed in the same academic year.

Electrical Engineering 591 H(2-4)

Individual Computer, Electrical, and Software Engineering Project
This project involves individual work on an assigned Computer, Electrical or Software Engineering topic under the supervision of a faculty member. The topic would normally involve a literature review, theoretical and experimental or computer work. A final report is required which is defended and presented orally.

Prerequisite(s): Formal approvals from the project supervisor and course coordinator(s).

Electrical Engineering 593 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.
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Engineering 597</td>
<td>Power Systems Operation and Markets</td>
<td>H(3-1T-3/2)</td>
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<td>Electrical Engineering 599</td>
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<tr>
<td>Electrical Engineering 601</td>
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<tr>
<td>Electrical Engineering 605</td>
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<td>Q(1.5S-0)</td>
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<tr>
<td>Electrical Engineering 607</td>
<td>Research Seminar</td>
<td>Q(1.5S-0)</td>
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<tr>
<td>Electrical Engineering 609</td>
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<td>Electrical Engineering 611</td>
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<td>Electrical Engineering 615</td>
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<tr>
<td>Electrical Engineering 619</td>
<td>Special Problems</td>
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<td>Electrical Engineering 623</td>
<td>Biomedical Instrumentation</td>
<td>H(3-1)</td>
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<tr>
<td>Electrical Engineering 625</td>
<td>Estimation Theory</td>
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<td>Electrical Engineering 627</td>
<td>Antennas</td>
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<tr>
<td>Electrical Engineering 629</td>
<td>Advanced Logic Design of Electronic and Nanoelectronic Devices</td>
<td>H(3-1)</td>
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<tr>
<td>Electrical Engineering 631</td>
<td>System Identification and Parameter Estimation</td>
<td>H(3-1)</td>
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<tr>
<td>Electrical Engineering 633</td>
<td>Wireless Networks</td>
<td>H(3-1)</td>
</tr>
<tr>
<td>Electrical Engineering 643</td>
<td>Fibre Optics Transmission</td>
<td>H(3-1)</td>
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</tbody>
</table>

#### 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 coordination, 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.

#### Individual Computer, Electrical, and Software Engineering 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 investigation. A comprehensive written report is required which is defended and presented orally in a department seminar.

#### Power System Operation

#### Rotating Machines

#### Research Seminar
- Reports of studies of the literature or of current research. This course is compulsory for all full-time graduate students.

#### 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.

#### System Identification and Parameter Estimation

#### Wireless Networks

#### 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.
Courses of Instruction

**Electrical Engineering 679** H(3-1)
(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** H(3-1)
(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/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** H(3-1)
(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 687** H(3-1)

**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, ac-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** H(3-0)

**Integrated CMOS Sensors**
Integrated CMOS sensors design aspects: fundamentals of silicon-based photo-transduction, CMOS active pixel sensor (APS) design - pixels, analog chain, modulation transfer function (MTF), photo-response analysis, sensor interfaces, analog to digital converters (ADCs), post-processing, practical system examples.

Prerequisite(s): Credit for both Electrical Engineering 691 and 619.26 will not be allowed.

**Electrical Engineering 693** 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 optimization and pricing, Transmission rights, procurement and pricing ancillary services, system security in deregulation, and resource management in a market environment.

Prerequisite(s): Credit for both Electrical Engineering 693 and 619.98 will not be allowed.

**Electrical Engineering 695** H(4-0)

**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 or equivalent.

**Energy and Environmental Systems EESS**

**Graduate Courses**

**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, the environment, and technology; 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** 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** 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** H(3-0)

**Tools for Systems Analysis**
This intensive block week 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 modeling. 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.
Courses of Instruction

Energy and Environmental Systems 619  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

English ENGL
Instruction offered by members of the Department of English in the Faculty of Arts.
Department Head - A. McWhir

Graduate Courses
English 603  H(3-0)
Studies in Genre
MAY BE REPEATED FOR CREDIT

English 605  H(3-0)
Studies in National or International Literatures
MAY BE REPEATED FOR CREDIT

English 607  H(3-0)
Theoretical and Cultural Studies
MAY BE REPEATED FOR CREDIT

English 609  H(3-0)
Studies in a Literary Period
MAY BE REPEATED FOR CREDIT

English 612  F(3-0)
Studies in Medieval and Renaissance Literature
MAY BE REPEATED FOR CREDIT

English 618  F(3-0)
Studies in Restoration and Eighteenth-Century Literature
MAY BE REPEATED FOR CREDIT

English 676  F(3-0)
Studies in Canadian Literature
MAY BE REPEATED FOR CREDIT

English 680  F(3-0)
Studies in Literary Criticism
MAY BE REPEATED FOR CREDIT

English 694  F(3-0)
Special Topics
MAY BE REPEATED FOR CREDIT

English 696  F(1-0)
Studies in Bibliography, Research Methods, and Palaeography
Note: Required of all graduate students who have not had an equivalent course.
NOT INCLUDED IN GPA

English 697  H(1-0)
Studies in the Academic Profession
Practical instructions in preparing materials necessary for the academic job market.
Note: Open only to post-candidacy doctoral students.

English 698  F(2-1T-1)
Studies in Creative Writing
Note: This course is double-numbered with English 598 (which will have separate and less strenuous student expectations). Though 598 and 698 may not both be counted for graduate credit, a student may take 598 as an undergraduate student and 698 as a graduate student in English. 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

Entrepreneurship and Innovation ENTI
Instruction offered by members of the Haskayne School of Business.
Entrepreneurship and Innovation Chairperson — S. Malach

Graduate Courses
Entrepreneurship and Innovation 781  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  H(3-1)
Opportunity Development
A project and case based course designed to explore concepts of opportunity development.

Entrepreneurship and Innovation 785  H(3-0)
Venture Development
A project based course designed around the formation of business concepts in the formalization of a business plan.
Antirequisite(s): Credit for both Entrepreneurship and Innovation 785 and Management Studies 797.81 will not be allowed.

Entrepreneurship and Innovation 787  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.
Antirequisite(s): Marketing 601 or consent of the Haskayne School of Business.

Entrepreneurship and Innovation 791  H(3-0)
(formerly Entrepreneurship and Innovation 797.01)
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  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  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  H(3S-0)

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 the 2011-2012 academic year. Students are advised that some of the courses listed below may not be offered in 2011-2012 if special circumstances require that they be dropped. Students should consult with the EVDS Graduate Program Administrator before registering for any course.

Undergraduate Courses
Environmental Design 501  H(4-0)
Interdisciplinary Seminar
Conceptual frameworks in Environmental Design and theories related to design and environment that influence environmental design thinking and practice.
Prerequisite(s): Open only to students in the Foundation year in the M.Arch degree program.
Antirequisite(s): Credit for both Environmental Design 501 and Architectural Studies 483 will not be allowed.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisite(s)</th>
<th>Antirequisite(s)</th>
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</thead>
<tbody>
<tr>
<td>EVDP 503</td>
<td>Sustainability in the Built Environment</td>
<td>Open only to students in the Foundation year in the MArch degree program.</td>
<td>Credit for both Environmental Design 503 and 603 will not be allowed.</td>
</tr>
<tr>
<td>EVDP 523</td>
<td>Special Topics in Environmental Design</td>
<td>Open to senior undergraduates with permission of instructor, and MArch Foundation year students.</td>
<td>Credit for both Environmental Design 523 and Architectural Studies 423 will not be allowed.</td>
</tr>
<tr>
<td>EVDP 583</td>
<td>Special Topics in Environmental Design</td>
<td>Intended to provide students with an introduction to the interdisciplinary area of Environmental Design, including principles of sustainable and diverse communities.</td>
<td>Credit for both Environmental Design 501 and 601 will not be allowed.</td>
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<tr>
<td>EVDP 597</td>
<td>Special Topics in Environmental Design</td>
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<tr>
<td>EVDP 601</td>
<td>Interdisciplinary Seminar</td>
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<tr>
<td>EVDP 602</td>
<td>Computer Modeling of the Environment</td>
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<tr>
<td>EVDP 603</td>
<td>Impact Assessment and Risk Management</td>
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<tr>
<td>EVDP 624</td>
<td>Landscape Planning and Ecological Design</td>
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<tr>
<td>EVDP 625</td>
<td>Housing, Neighbourhood Change and Equity</td>
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<td>EVDP 626</td>
<td>Field Studies</td>
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<tr>
<td>EVDP 643</td>
<td>Studio in Environmental Design</td>
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<tr>
<td>EVDP 651</td>
<td>Urban Design Theory</td>
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</table>
### Courses of Instruction

#### Environmental Design 675
(formerly Environmental Design 683.72)

**Urban Systems (Barcelona Studies)**

Provides a general overview of Barcelona’s urban history, development and planning traditions. Lectures and field studies give a chronological overview of the city’s urban, architectural and design history and the inter-relation to political programs, economic and strategic planning as well as cultural nationalism. From the Barcelona case 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.

**Antirequisite(s):** Not open to students with credit in Environmental Design 683.72.

#### Environmental Design 683

**Advanced Special Topics in Environmental Design**

Thematic inquiry and design related to urban design, architecture, environmental science, industrial design and planning.

**Note:** Block courses labelled EVDB will be graded on a CR/F basis.

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 697

**Directed Study in Environmental Design**

Thematic research, readings or design studio project related to urban design, architecture, environmental science, ecological design, history and theory, industrial design or planning.

**Prerequisite(s):** Open only to Environmental Design degree students with consent of the Associate Dean (Academic).

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 703

**Directed Study in Environmental Design**

Thematic research, readings or design studio project related to urban design, architecture, environmental science, ecological design, history and theory, industrial design or planning.

**Prerequisite(s):** Open only to Environmental Design degree students with consent of the Associate Dean (Academic).

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 705

**Directed Study in Environmental Design**

Thematic research, readings or design studio project related to urban design, architecture, environmental science, ecological design, history and theory, industrial design or planning.

**Prerequisite(s):** Open only to Environmental Design degree students with consent of the Associate Dean (Academic).

**MAY BE REPEATED FOR CREDIT NOT INCLUDED IN GPA**

#### Environmental Design 711

**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

**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.

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 751

**Research Design Studio**

Exploration of the research process in a design context and using design as a method of research. Design of innovative research methods appropriate for environmental design research in thematic areas related to urban design, industrial design, ecological design, sustainable design and digital design.

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 762

**Advanced Studio in Environmental Design**

Topics vary from year to year, depending on such factors as current issues and contemporary problems. A number of studio topics may be offered to accommodate a variety of interests.

**Note:** Full course offered in single term only.

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 783

**Directed Study in Environmental Design**

Thematic research, readings or design studio project related to urban design, architecture, environmental science, ecological design, history and theory, industrial design or planning.

**Prerequisite(s):** Open only to Environmental Design degree students with consent of the Associate Dean (Academic).

**MAY BE REPEATED FOR CREDIT**

#### Environmental Design 785

**Directed Study in Environmental Design**

Thematic research, readings or design studio project related to urban design, architecture, environmental science, ecological design, history and theory, industrial design or planning.

**Prerequisite(s):** Open only to Environmental Design degree students with consent of the Associate Dean (Academic).

**MAY BE REPEATED FOR CREDIT NOT INCLUDED IN GPA**

#### Environmental Design 793

**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):** Permission of the Instructor.

#### Environmental Design 799

**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. An approved preceptorship assignment is equivalent to full-time studies. Preceptorships are not normally approved until a Program of Study is at least conditionally approved.

**MAY BE REPEATED FOR CREDIT**

### Environmental Design Architecture EVDA

#### Undergraduate Courses

#### Environmental Design Architecture 511

**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):** Credit for both Environmental Design Architecture 511 and Architectural Studies 449 will not be allowed.

#### Environmental Design Architecture 523

**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.


523.02. History of Architecture and Human Settlements II - The Western Tradition 1400 to Present.

**Antirequisite(s):** Credit for both Environmental Design Architecture 523 and Architectural Studies 457 will not be allowed.

#### Environmental Design Architecture 541

**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.

**Antirequisite(s):** Credit for both Environmental Design Architecture 541 and Architectural Studies 451 will not be allowed.

#### Environmental Design Architecture 543

**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.

**Antirequisite(s):** Credit for both Environmental Design Architecture 543 and Architectural Studies 453 will not be allowed.
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<tr>
<th>Course Code</th>
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<tr>
<td>EVDP 561</td>
<td>Architectural Professional Practice I</td>
<td>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.</td>
</tr>
<tr>
<td>EVDP 561</td>
<td>Architectural Professional Practice II</td>
<td>An overview of the structure, organization and changing roles of the design professions through history with emphasis on emerging patterns of practice. The procedures, constraints and opportunities of practice in its legal, ethical and technical dimensions will be analyzed using a case study method.</td>
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<tr>
<td>EVDP 561</td>
<td>Environmental Design Architecture 661</td>
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<td>Senior Research Studio in Architecture</td>
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<td>Environmental Design Planning 625</td>
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<td>Environmental Design Planning 625 (formerly Environmental Design Planning 525)</td>
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<td>Environmental Design Planning 627 (formerly Environmental Design Planning 527)</td>
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<td>Planning History, Theory, and Ethics</td>
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<td>Planning Public Engagement</td>
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<td>Environmental Design Planning 621</td>
<td>H(3-0)</td>
<td>Environmental Design Planning 621 (formerly Environmental Design Planning 521)</td>
</tr>
<tr>
<td>Environmental Design Planning 623</td>
<td>H(3-0)</td>
<td>Environmental Design Planning 623 (formerly Environmental Design Planning 523)</td>
</tr>
<tr>
<td>Environmental Design Planning 625</td>
<td>H(0-8)</td>
<td>Environmental Design Planning 625 (formerly Environmental Design Planning 525)</td>
</tr>
<tr>
<td>Environmental Design Planning 627</td>
<td>H(3-0)</td>
<td>Environmental Design Planning 627 (formerly Environmental Design Planning 527)</td>
</tr>
<tr>
<td>Planning History, Theory, and Ethics</td>
<td>Environmental Design Planning EVDP</td>
<td>Planning History, Theory, and Ethics (formerly Environmental Design Planning 523)</td>
</tr>
<tr>
<td>Planning Public Engagement</td>
<td>Environmental Design Planning EVDP</td>
<td>Planning Public Engagement (formerly Environmental Design Planning 525)</td>
</tr>
</tbody>
</table>
Environmental Engineering 633 H(3-0)

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 are also addressed.

Environmental Design Planning 635 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. Potential topics include: population forecasting, trend analyses, needs assessment, program and policy evaluation, and SWOT analysis. Techniques to present information effectively.

Environmental Design Planning 637 H(0-8)

Community Planning

Overall objective is to introduce students to land use planning and development issues in the suburban context. Addresses one of the most important urban challenges related to smart growth management. Provides a step-by-step introduction to community planning processes and essential planning policies to develop a development that is economically feasible, socially inclusive and environmentally friendly.

Advanced Professional Planning Project

A research oriented project studio that explores contemporary themes in planning and provides training in advanced professional planning practice. Centres on a real world problem or project; involves the analysis of issues and context, and the formulation of a policy, plan or design solution. Culminates in a professional report and presentation.

Prerequisite(s): Open only to students in the MEdes (Planning) course-based program.

Note: Full course offered in single session only.

Environmental Engineering ENEN

Instruction and services offered by Centre for Environmental Engineering Research & Education (CEERE), Schulich School of Engineering.

Director of CEERE: Dr. Anil K. Mehrotra

Graduate Courses

Environmental Engineering 601 E(0-3S)

Research Seminar

Oral presentations consisting of reports on studies of the literature or of current research. Required of all full-time graduate students registered in MSc and PhD degree programmes in Environmental Engineering.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Environmental Engineering 603 H(3-0)

Principles of Environmental Engineering


Environmental Engineering 605 H(3-0)

Environmental Chemistry and Microbiology


Environmental Engineering 606 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

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 605 and Chemical Engineering 619.19 will not be allowed.

Environmental Engineering 619 H(3-0)

Air Dispersion Modelling


Environmental Engineering 623 H(3-0)

Earth Observation for the Environment

An introduction to environmental earth observation systems, in particular Earth observation data analysis techniques for fusing multi-dimensional datasets (i.e., multi-spectral, multi-temporal, multi-resolution, and point-source ground data). A number of environmental issues will be discussed, including carbon sequestration; advanced techniques for estimating biophysical variables that are integral parts in various environmental models; vegetation phenology; and understanding of climatic influence on forested and polar ecosystems, etc.

Antirequisite(s): Credit for Environmental Engineering 637 and 619.05 or Geomatics Engineering 637 will not be allowed.

Environmental Engineering 627 H(3-0)

Contaminant Transport


Environmental Engineering 631 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 H(3-0)

Fuzzy Logic for Environmental Engineering

Complex, nonlinear, 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 H(2-2)

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 639 H(3-0)

Environmental Chemistry and Microbiology

The biosphere, geosphere, hydrosphere and atmosphere. Contaminant partitioning and transport in air, surface water and groundwater. Chemical reaction
<table>
<thead>
<tr>
<th>Courses of Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Engineering 641 and Chemical Engineering 643 will not be allowed</td>
</tr>
<tr>
<td><strong>Air Pollution Control Engineering</strong></td>
</tr>
<tr>
<td>Introduction to air quality and air pollution. Impact of air pollution and greenhouse gases on health and climate change. Energy and air pollution. Fundamentals of fossil fuel combustion and related air pollution. Pre-combustion air pollution control strategies; fossil fuel cleaning/refinery, renewable energy (wind, solar, biomass, etc.), and alternative energy sources (hydrogen, etc.). In-combustion air pollution control. Post-combustion air pollution control. Industrial air pollution control. Control of particulate matter. Control of VOCs, SOx, and NOx. Adsorption and absorption of air pollutants.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 643</strong> H(3-0)</td>
</tr>
<tr>
<td><strong>Advanced Topics in Solid Waste Engineering</strong></td>
</tr>
<tr>
<td><strong>Environmental Engineering 651</strong> H(3-0)</td>
</tr>
<tr>
<td>Contaminated Soil Remediation</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 653</strong> H(3-0) (Civil Engineering 747)</td>
</tr>
<tr>
<td>Hazardous Waste and Contaminated Sites Management</td>
</tr>
<tr>
<td><strong>Environmental Engineering 655</strong> H(3-0)</td>
</tr>
<tr>
<td>Wastewater Issues for the Oil and Gas Industry</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 665</strong> H(3-0)</td>
</tr>
<tr>
<td>Energy and Environment</td>
</tr>
<tr>
<td>Energy overview from primary energy to end use; formation, extraction, and transformations of fossil fuels; physics and engineering of nuclear power; renewable energy sources: biomass, solar and wind; electricity generation, transmission and economics; building energy systems; heat and power integration; greenhouse gas (GHG) emissions and technical options for reduction of GHGs; energy utilization and efficiency.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 671</strong> H(3-0)</td>
</tr>
<tr>
<td>Thermal Systems Analysis</td>
</tr>
<tr>
<td>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 systems; Co-generation design; Heat exchanger design; Energy storage systems; Optimization process.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 673</strong> H(3-0)</td>
</tr>
<tr>
<td>Project in Environmental Engineering I</td>
</tr>
<tr>
<td>A one-term half-course which 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.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 681</strong> H(0-6)</td>
</tr>
<tr>
<td>Project in Environmental Engineering II</td>
</tr>
<tr>
<td>A two-term full-course which 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.</td>
</tr>
<tr>
<td><strong>Environmental Engineering 682</strong> F(0-6)</td>
</tr>
<tr>
<td>Environmental Policy Analysis</td>
</tr>
<tr>
<td><strong>Environmental Engineering 691</strong> H(3-0)</td>
</tr>
<tr>
<td>Life Cycle Assessment</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>
Courses of Instruction

Finance FNCE

Instruction offered by members of the Haskayne School of Business.

Finance Chairperson — T. Cottrell

Graduate Courses

Finance 601 H(3-1)

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 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 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 H(3-1)

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 H(3-1)

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 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 H(3-1)

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 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 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 H(3-0)

New Venture Finance


Prerequisite(s): Finance 601 or consent of the Haskayne School of Business.

Finance 789 H(3S-1)

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 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 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 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

Fine Arts FINA

Instruction offered by the Faculty of Arts.

Graduate Courses

Fine Arts 601 H(0-3)

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 603 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.

Directeur du Département – E. Montes Garcés

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Arts.

Department Head – E. Montes Garcés

Not all senior courses are offered every year. Current course offerings are listed in the Master Timetable.

Undergraduate Courses

French 511 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): Préalables: Trois demi-cours de français de niveau 400, ou autorisation du Département.

Note: Remarque: Ce cours est obligatoire pour les étudiants inscrits au programme du baccalauréat spécialisé (“Honours”) de français.

MAY BE REPEATED FOR CREDIT
Courses of Instruction

French 539 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 au sens large. Le format et le contenu peuvent varier d’une année à l’autre.

Prerequisite(s): Préalables: Trois demi-cours de français de niveau 400 ou autorisation du Département.

MAY BE REPEATED FOR CREDIT

French 549 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): Préalables: Trois demi-cours de français de niveau 400 ou autorisation du Département.

MAY BE REPEATED FOR CREDIT

French 557 H(3-0)

Littérature et culture françaises du 17e siècle
Étude de textes choisis du “Grand siècle”. Le format et le contenu peuvent varier d’une année à l’autre.

Prerequisite(s): Préalables: Trois demi-cours de français de niveau 400 ou autorisation du Département.

MAY BE REPEATED FOR CREDIT

French 559 H(3-0)

Littérature et culture françaises du 18e siècle
Étude de textes choisis du Siècle des Lumières en France. Le format et le contenu peuvent varier d’une année à l’autre.

Prerequisite(s): Préalables: Trois demi-cours de français de niveau 400 ou autorisation du Département.

MAY BE REPEATED FOR CREDIT

French 599 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: la littérature française du Moyen-Age, l’autobiographie, l’écriture des femmes de langue française, le créole dans les sociétés du Moyen-Age, l’autobiographie, l’écriture des femmes de langue française, etc.

Prerequisite(s): Préalables: Trois demi-cours de français de niveau 400, ou autorisation du Département.

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.

(Le 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 H(3-0)

Problématiques littéraires et culturelles
MAY BE REPEATED FOR CREDIT

French 611 H(3-0)

Langue française
MAY BE REPEATED FOR CREDIT

French 615 H(3-0)

Images, textes, performance
MAY BE REPEATED FOR CREDIT

French 625 H(3-0)

 Études cinématographiques
MAY BE REPEATED FOR CREDIT

French 635 H(3-0)

Le texte narratif
MAY BE REPEATED FOR CREDIT

French 641 H(3-0)

Littérature et culture avant 1800
MAY BE REPEATED FOR CREDIT

French 645 H(3-0)

La Modernité
MAY BE REPEATED FOR CREDIT

French 655 H(3-0)

Francophonies
MAY BE REPEATED FOR CREDIT

French 665 H(3-0)

 Études postcoloniales
MAY BE REPEATED FOR CREDIT

French 675 H(3-0)

 Féminismes et Gender
MAY BE REPEATED FOR CREDIT

French 685 H(3-0)

Voix québécoises et canadiennes
MAY BE REPEATED FOR CREDIT

French 691 H(3-0)

 Autour d’un auteur
MAY BE REPEATED FOR CREDIT

French 695 H(3-0)

Profession et recherche
MAY BE REPEATED FOR CREDIT

French 699 H(3-0)

Thèmes spéciaux
MAY BE REPEATED FOR CREDIT

Geography GEOG

Instruction offered by members of the Department of Geography in the Faculty of Arts.

Department Head – B. Moorman

Graduate Courses

Geography 603 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.

Antirequisite(s): Credit for both Geography 603 and 699.33 will not be allowed.

Geography 605 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.

Antirequisite(s): Credit for both Geography 605 and 699.39 will not be allowed.

Geography 607 H(3-3)

Geographic Information Systems: Basics and Beyond
Introduction to the world of Geographic Information Systems (GIS). Includes: representing reality in the digital world, 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.

Antirequisite(s): Credit for both Geography 607 and 699.47 will not be allowed.

Geography 619 H(3-2)

Spatial Ecology
Applies the principles of landscape ecology and conservation biology to the study of spatial effects on individual species and on the structure, dynamics, diversity and stability of multi-species communities. The use of GIS and remote sensing technologies is a central theme. Topics include habitat fragmentation, metapopulation analysis and viability, wildlife habitat modelling (static and dynamic), management of endangered species, and spatial decision support. Other aspects of this course include the importance and use of indicator, umbrella, keystone and flagship species in conservation.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Not open to students with credit in Geography 695.11.
<table>
<thead>
<tr>
<th>Courses of Instruction</th>
<th>179</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geography 633</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Research and Applications in Remote Sensing</td>
<td>Review of basic and advanced principles of image analysis; advanced laboratory techniques. Integration of remote sensing with GIS; current research in remote sensing. Project organization; data sources for remote sensing.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 635</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Active Microwave Remote Sensing</td>
<td>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.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Geography 635 and 699.35 will not be allowed.</td>
</tr>
<tr>
<td><strong>Geography 639</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Advanced Spatial Analysis and Modelling</td>
<td>History of spatial modelling in geography; comprehensive coverages of techniques, spatial analysis and spatial modelling as currently used within GIS and remote sensing.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 647</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Advanced Research and Applications in Geographic Information Systems</td>
<td>Focus on advanced GIS applications in core areas; methodological developments in GIS, and current research directions in GIS.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 649</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Enterprise GIS and Database Management Systems</td>
<td>Advanced topics in GIS and database systems, including integration of enterprise database systems with a GIS, data modelling, database management, distributed GIS via the world wide web, and web-based GIS.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Geography 647 or consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 667</strong></td>
<td>H(3-3)</td>
</tr>
<tr>
<td>Advanced GIS Programming with ArcObjects</td>
<td>Advanced programming techniques in ArcGIS using the ArcObjects framework. Topics include customizing the user interface, COM and interface-based programming techniques, and creating macros to perform advanced tasks in ArcGIS. A significant portion of evaluation will be based on an independent term project. Completion of a pre-study package is required.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 681</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Geographic Information Systems Project: Theoretical Issues</td>
<td>A critical and comprehensive review of information and literature on a GIS research topic. This course provides the conceptual basis for Geography 683.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Geography 633, 639 and 647 and consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 685</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Arctic System Science</td>
<td>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.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Geography 681 and consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 688</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Selected Topics in Geographic Research Methods</td>
<td>A list of specific subtitles for the 700-level courses listed below is available in the Department.</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
<tr>
<td><strong>Geography 779</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Selected Topics in Physical Geography</td>
<td>May be repeated for credit</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Consent of the Department.</td>
</tr>
</tbody>
</table>

### Geology GLGY

**Geology 503** | 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. |
Note: | A weekend field excursion will be run in September. |

**Geology 505** | 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 503. |
Antirequisite(s): | Geology 505 and Geology 609 will not be allowed. |

**Geology 523** | 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 423. |

**Geology 527** | H(3-3) |
One 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 443. |
Note: | Normally offered in even-odd dated academic years. However, this course may be offered in any year in which sufficient interest is indicated to the Department prior to November 1 of the preceding academic year. A weekend field trip will be run in September. |
Courses of Instruction

Geology 531 H(3-1T-3)

Advanced Igneous Petrology
Mineralogical and chemical classifications of igneous rocks. Physics and chemistry of igneous rock formation. Laboratory includes hand specimen and microscopic petrology.
Prerequisite(s): Geology 323, 341, and 443.

Geology 533 H(3-1T-3)

Metamorphism and Lithosphere Evolution
Application of metamorphic petrology to pure and applied problems in Earth science, especially lithosphere evolution. Integration of metamorphic petrology with structure, geochronology and tectonics. Interpretation of mineral assemblages; pressures and temperatures of formation of metamorphic rocks; rates and controls of metamorphic processes. Laboratory will consist of petrographic studies of rock suites, instrumental analysis (electron probe, XRD), and elementary use of phase equilibrium software packages.
Prerequisite(s): Geology 323 and 443.

Note: Normally offered in odd-even dated academic years. However, this course may be offered in any year in which sufficient interest is indicated to the Department prior to November 1 of the preceding academic year.

Geology 537 H(160 hours)

Field Methods III
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 435, 443, and 461. A minimum grade of "B" is required in Geology 435.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. It may occur outside Canada. Students will be required to cover half of accommodation costs, and to pay a surcharge to cover the costs of equipment and other resources.

Geology 541 H(3-1T-3)

Advanced Structural Geology
Structural features of complexly folded strata; simple statistical analysis of data; structural analysis in plutonic and metamorphic rocks; applications to exploration and exploitation.
Prerequisite(s): Geology 341 and completion of at least 15 full-course equivalents.
Antirequisite(s): Credit for both Geology 541 and 641 will not be allowed.
Note: There is a weekend field excursion during the term.

Geology 543 H(3-3)

Advanced Igneous and Metamorphic Petrology
Advanced study of igneous and metamorphic petrology, and application to problems in earth science. Includes use of microscopy and geochemistry, as well as possible application of instrumental methods.
Prerequisite(s): Geology 443.

Geology 555 H(3-3)

Global Geology
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 443 or Geophysics 457.

Geology 561 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 435 or 441 and 461.

Geology 563 H(3-3)

Geological History of the Western Canadian Sedimentary Basin
Stratigraphic assembly, tectonic evolution and resources of the WCSB within the Precambrian crystalline basement to the Jurassic-Paleogene Foreland Basin succession in the subsurface and exposures in the Rocky Mountains.
Prerequisite(s): Geology 443 and 461; or Geophysics 457.

Geology 571 H(3-1T-3)

Engineering Geology
Application of geology to engineering problems with emphasis on the geologic aspects of site and environmental investigations. Characterization of rock masses and surficial deposits and examination of their behaviour; special mapping methods, air photo interpretation and the application of some geophysical techniques.
Prerequisite(s): Geology 341 and Geophysics 355.

Note: Completion of Geology 401 is highly recommended prior to taking this course. Students who have not completed Geology 401 are advised to attend the tutorial session of Geology 571, offered during January block week.

Geology 585 Q(3-3)

Biostratigraphy
Principles of applied biostratigraphy for siliceous and calcareous microfossils and conodonts with emphasis on their use in basin analysis, sequence stratigraphy, and economic resource exploration.
Prerequisite(s): Geology 491.
Antirequisite(s): Credit for both Geology 585 and 685 will not be allowed.

Geology 589 E(3-3)

Selected Topics in Petroleum Geology I
589.01. Aqueous Fluids
589.02. Petroleum Fluids
589.06. Professional Practice for Geoscientists
589.07. Analytical Techniques for Petroleum Geochemistry
589.08. Petroleum Generation and Migration
Prerequisite(s): Geology 449 or Geophysics 449 and Geology 461 or Geophysics 457.
Antirequisite(s): Credit for both Geology 589 and 689 will not be allowed.

Geology 593 Q(3-3)

Selected Topics in Petroleum Geology II
593.02. Stratigraphy and Sedimentation of Clastic Rocks
593.03. Stratigraphy and Sedimentation of Carbonate Rocks
593.05. Ichnology
593.06. Professional Practice for Geoscientists.
Prerequisite(s): Geology 449 or Geophysics 449 and Geology 461 or Geophysics 457.
Antirequisite(s): Credit for both Geology 593 and 693 will not be allowed.

Geology 595 H(3-3)

Selected Topics in Petroleum Geology III
595.01. Petroleum Geology III Core Examination
595.03. Reservoir Evaluation and Hydrocarbon Play Assessment
595.05. Basin Analysis
Prerequisite(s): Geology 449 or Geophysics 449 and Geology 461 or Geophysics 457.
Antirequisite(s): Credit for both Geology 595 and 694 will not be allowed.

Note: Students who have taken Geology 561 should take Geology 694.01, not 595.01.

Geology 596 F(3-3)

Selected Topics in Petroleum Geology IV
Courses are offered in specific topics related to Petroleum Geology. Topics may include subsurface mapping, play assessment, reservoir characterization, reservoir geology, reserves and resources, basin analysis, petroleum geochemistry.
Prerequisite(s): Geology 449 or Geophysics 449 and Geology 461 or Geophysics 457.
Antirequisite(s): Credit for both Geology 596 and 696 will not be allowed.

MAY BE REPEATED FOR CREDIT

Geology 597 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 283 or Applied Mathematics 219 and Mathematics 211 and completion of at least 15 full-course equivalents or consent of the Department.
Antirequisite(s): Credit for both Geology 597 and 697 will not be allowed.

Geology 599 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): Consent of the Department.
MAY BE REPEATED FOR CREDIT
Courses of Instruction

Graduate Courses

Graduate students are urged to read the Geoscience Department section in the Graduate Studies calendar.

Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geology 601

Advanced Physical Hydrogeology

An advanced treatment of topics covered in Geology 401.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for both Geology 601 and 401 will not be allowed.

Geology 603

Advanced Aqueous Geochemistry

Advanced discussion of theoretical and applied aspects of aqueous geochemistry of natural waters. Topics include: methods for collection and preservation of water samples in the field, laboratory analysis of waters, theory and application of aqueous geochemical models to complex formation, solubility, stability of low temperature mineral assemblages, oxidation and reduction processes in natural environments and reaction path modelling. Applications of stable isotopes to low temperature geochemical processes may also be covered.

Prerequisite(s): Geology 503 or Geophysics 457.

Geology 605

Groundwater Flow and Transport Modeling

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 modeling project.

Prerequisite(s): Geology 401 or 601 or consent of the Department.

Geology 607

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 283 or Applied Mathematics 219 and Geography 415 and Geology 401; or consent of the Department.

Geology 609

Advanced Contaminant Hydrogeology

An advanced treatment of topics covered in Geology 505.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for both Geology 609 and Geology 505 will not be allowed.

Geology 611

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 283 or Applied Mathematics 219 and Geology 401 or Geography 415.

Geology 613

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 advanced 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 or 423.

Antirequisite(s): Credit for both Geology 613 and either 699.20 or Petroleum Engineering 513 will not be allowed.

Geology 623

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

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

Advanced Igneous and Metamorphic Petrology

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 443 or equivalent or consent of the Department.

Geology 639

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. Geology 639 normally runs for two to three weeks following Winter Term Final Examinations or prior to the Fall Term.

Prerequisite(s): Geology 401 or 601 and consent of the Department.

Antirequisite(s): Credit for both Geology 639 and 441 will not be allowed.

Note: This course has limited enrolment.

Geology 641

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 both Geology 641 and 541 will not be allowed.

Note: There is a weekend field excursion during the term.

Geology 649

H(3-2)

(Geophysics 649)

Advanced Petrophysical Techniques

Application of petrophysical well logs and their relation to cores, cuttings, fluids and seisograms. Case studies applied to petroleum exploration and exploitation.

Prerequisite(s): Consent of the Department.

Antirequisite(s): Credit for both Geology 649 and any of 649, Geophysics 449, or 649 will not be allowed.

Geology 655

H(3-3)

Unconventional Gas Reservoir Characterization and Evaluation

Overview of the unique storage and production mechanisms associated with coals, tight gas and shale gas reservoirs; adsorbed gas storage and modeling; 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 both Geology 655 and Geology 699.37 will not be allowed.

Geology 663

H(2-1)

(Physics 663)

Applications of Stable Isotopes

Applications in archaeology, biology, chemistry, engineering, geography, geology, medicine, meteorology, paleontology, physics and space sciences. Topics include hydrology, paleoecologies, ore deposits, geothermometry, fossil fuels exploration and recovery, pollutant tracing, food webs forensic investigations.

Prerequisite(s): Consent of the Department.

Geology 675

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 instructor or enrolment in a paleontology-based graduate program.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology 677</td>
<td>Advanced Topics in Oil and Gas Production</td>
<td>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.</td>
<td>Prerequisite(s): Petroleum Engineering 513 or Geology 613 or consent of the Department. Antirequisite(s): Geology 677 and either Chemical Engineering 619.26 or 677 will not be allowed.</td>
</tr>
<tr>
<td>Geology 679</td>
<td>Petroleum and Environmental Organic Geochemistry</td>
<td>Origin of petroleum; sedimentation of organic matter and the carbon cycle; diageneis 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.</td>
<td>Prerequisite(s): Consent of the Department.</td>
</tr>
<tr>
<td>Geology 685</td>
<td>Advanced Biostratigraphy</td>
<td>Advanced studies of the principles of applied biostratigraphy for siliceous and calcareous microfossils and conodonts with emphasis on their use in basin analysis, sequence stratigraphy, and economic resource exploration.</td>
<td>Prerequisite(s): Consent of the Department. Antirequisite(s): Credit for both Geology 685 and 585 will not be allowed.</td>
</tr>
<tr>
<td>Geology 689</td>
<td>Advanced Petroleum Geology I</td>
<td>A written report based on a literature review is assigned reading, seminars and field trips to local geological sites.</td>
<td>Prerequisite(s): Consent of the Department. Antirequisite(s): Credit for both Geology 689 and 589 will not be allowed.</td>
</tr>
<tr>
<td>Geology 693</td>
<td>Advanced Petroleum Geology II</td>
<td>A written report based on a literature review is assigned reading, seminars and field trips to local geological sites.</td>
<td>Prerequisite(s): Consent of the Department. Antirequisite(s): Credit for both Geology 693 and 593 will not be allowed.</td>
</tr>
<tr>
<td>Geology 694</td>
<td>Advanced Petroleum Geology III</td>
<td>A written report based on a literature review is assigned reading, seminars and field trips to local geological sites.</td>
<td>Prerequisite(s): Consent of the Department. Antirequisite(s): Credit for both Geology 694 and 595 will not be allowed.</td>
</tr>
<tr>
<td>Geology 696</td>
<td>Advanced Petroleum Geology IV</td>
<td>Courses are offered in specific topics related to Petroleum Geology and the application of techniques to case studies of petroleum systems.</td>
<td>Prerequisite(s): Consent of the Department. Antirequisite(s): Credit for both Geology 696 and 596 will not be allowed. MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Geology 697</td>
<td>Advanced Geostatistics</td>
<td>Advanced treatment of the topics covered in Geology 597 with special emphasis on reservoir characterization.</td>
<td>Prerequisite(s): Mathematics 253 or 283 or Applied Mathematics 219 and Mathematics 211, or consent of the Department. Antirequisite(s): Credit for both 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.</td>
</tr>
<tr>
<td>Geology 698</td>
<td>Reservoir Characterization for Field Development</td>
<td>A team-based, integrated reservoir description experience working with geophysical, geological, petrophysical, and engineering data to produce a field development plan.</td>
<td>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 Engineering with Reservoir Characterization Specialization.</td>
</tr>
<tr>
<td>Geology 699</td>
<td>Selected Topics in Geology</td>
<td>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. MAY BE REPEATED FOR CREDIT</td>
<td></td>
</tr>
<tr>
<td>Geology 701</td>
<td>Advanced Independent Study</td>
<td>A written report based on laboratory and field studies is required. Note: Open only to graduate students in the Department of Geoscience.</td>
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</tr>
<tr>
<td>Geology 703</td>
<td>Readings in Geology</td>
<td>A written report based on a literature review is required. Note: Open only to graduate students in the Department of Geoscience.</td>
<td></td>
</tr>
<tr>
<td>Geology 707</td>
<td>Geology and Geophysics of Western Canada</td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
### Courses of Instruction

#### Geomatics Engineering ENGO

Instruction offered by members of the Department of Geomatics Engineering in the Schulich School of Engineering.

Department Head – A. Habib
Associate Heads – K. O’Keefe, D.J. Marceau

### Undergraduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geomatics Engineering 500</td>
<td>F(1-5)</td>
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<tr>
<td>Geomatics Engineering 501</td>
<td>H(152 hours)</td>
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</tr>
<tr>
<td>Geomatics Engineering 531</td>
<td>H(2-2)</td>
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</tr>
<tr>
<td>Geomatics Engineering 545</td>
<td>H(2-2)</td>
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</tr>
<tr>
<td>Prerequisite(s): Geomatics Engineering 361 and 465.</td>
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<tr>
<td>Geomatics Engineering 551</td>
<td>H(2-2)</td>
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<tr>
<td>Special Topics in Geospatial Information Systems</td>
<td>Special topics in the research, development and applications of geospatial information systems. Internet and Web GIS, Mobile/Wireless GIS and Location Based Services (LBS), 3D GIS, GIS Interoperability, Ontology, Spatial Data Infrastructures, Geo-Sensor Networks and Spatial Sensor Web, Social Networks, and Collaborative GIS. Lbs and group projects will focus on 3D GIS/Google Earth Applications.</td>
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<tr>
<td>Prerequisite(s): Fourth Year Standing.</td>
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<tr>
<td>Geomatics Engineering 559</td>
<td>H(2-2)</td>
<td></td>
</tr>
<tr>
<td>Digital Imaging and Applications</td>
<td>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: digital image acquisition and sampling, image enhancement in the spatial and frequency domain, color image processing, image restoration, image segmentation, image compression and multi-source image/data fusion.</td>
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<tr>
<td>Prerequisite(s): Electrical Engineering 327 and Geomatics Engineering 435.</td>
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<tr>
<td>Geomatics Engineering 563</td>
<td>H(2-2)</td>
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<tr>
<td>Prerequisite(s): Geomatics Engineering 361.</td>
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<tr>
<td>Geomatics Engineering 567</td>
<td>H(2-3)</td>
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<tr>
<td>High-Precision Surveys</td>
<td>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 coordinates and coordinate 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.</td>
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<tr>
<td>Prerequisite(s): Geomatics Engineering 343, 361 and 419.</td>
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<tr>
<td>Corequisite(s): Geomatics Engineering 501.</td>
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<tr>
<td>Geomatics Engineering 573</td>
<td>H(2-2)</td>
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<tr>
<td>Digital Terrain Modelling</td>
<td>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 (e.g. photogrammetric data capture, digitized cartographic data sources capturing, other methods: IFSAR, and laser altimeters) processing, storage, manipulation, and applications of DTM. Models of DTM (Grids, Contours, and TINS). 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, orthophotos and drainage networks.</td>
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<tr>
<td>Prerequisite(s): Engineering 407 and Geomatics Engineering 431.</td>
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<tr>
<td>Geomatics Engineering 579</td>
<td>H(2-3)</td>
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<tr>
<td>Prerequisite(s): Geomatics Engineering 455 and 443.</td>
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<tr>
<td>Corequisite(s): Geomatics Engineering 501.</td>
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<tr>
<td>Geomatics Engineering 581</td>
<td>H(2-2)</td>
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<tr>
<td>Prerequisite(s): Geomatics Engineering 455.</td>
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<tr>
<td>Corequisite(s): Geomatics Engineering 579.</td>
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<tr>
<td>Geomatics Engineering 583</td>
<td>H(2-2)</td>
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<tr>
<td>Geomatics Engineering 583</td>
<td>Environmental Engineering 635</td>
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<tr>
<td>Environmental Modelling</td>
<td>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.</td>
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<tr>
<td>Prerequisite(s): Fourth year standing.</td>
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<tr>
<td>Geomatics Engineering 585</td>
<td>H(2-2)</td>
<td></td>
</tr>
<tr>
<td>Prerequisite(s): Electrical Engineering 327 and Geomatics Engineering 465.</td>
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</tbody>
</table>
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 web site (http://www.geomatics.ucalgary.ca) for current course listings.

Geomatics Engineering 601 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 examination is required upon completion of the course.

Note: Open only to students in the course-only route MEng.

Geomatics Engineering 605 Q(0-1S)

Research Seminar I
Seminar presentation of studies related to the student's research.

Note: Compulsory for all MSc graduate students.

NOT INCLUDED IN GPA

Geomatics Engineering 607 Q(0-1S)

Research Seminar II
Seminar presentation of studies related to the student’s research. Should not normally be taken in the same term as Geomatics Engineering 605.

Note: Compulsory for all PhD graduate students.

NOT INCLUDED IN GPA

Geomatics Engineering 609 Q(0-1S)

Research Seminar III
Seminar presentation of studies related to the student’s research. Should not normally be taken in the same term as Geomatics Engineering 607.

Note: Compulsory for all PhD graduate students.

NOT INCLUDED IN GPA

Geomatics Engineering 615 H(3-0)

Advanced Physical Geodesy

Antirequisite(s): Not open to students with credit in Geomatics Engineering 611 or 617.

Geomatics Engineering 620 H(2-2)

Estimation for Navigation

Geomatics Engineering 623 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 coordinate frames, step by step computerization 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 H(3-2)

Advanced GNSS Theory and Applications

Geomatics Engineering 629 H(3-0)

Advanced Estimation Methods and Analysis

Geomatics Engineering 633 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 H(3-0)

Environmental Engineering 637 H(3-0)

Earth Observation for the Environment
An introduction to environmental earth observation systems in particular to satellite platforms. Techniques for fusion multidimensional datasets (i.e., multi-spectral, multi-temporal, multi-resolution, and point-source ground data). A number of environmental issues will be discussed, including carbon sequestration, advanced techniques for estimating biophysical variables that are integral parts of various environmental models; vegetation phenology; and understanding of climatic influence on forested and polar ecosystems, etc.

Antirequisite(s): Credit for any of Environmental Engineering 637 or 619.05 and Geomatics Engineering 637 will not be allowed.

Geomatics Engineering 638 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 642 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 ranging 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 segmenta-

Geomatics Engineering 645 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 655 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.

In the Department of Geomatics Engineering, following are the graduate courses normally offered.
Courses of Instruction

Geomatics Engineering 658 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 modeling, Multi-agent system modeling, 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 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 (modeling the perspective geometry of line cameras, epipolar geometry for line cameras). Multi-sensor aerial triangulation (integrating aerial and satellite imagery with naviga
tion 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 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 modeling, generalized linear mixed models, estimation and modeling of nonstationary covari
ces, and spatio-temporal processes.

Geomatics Engineering 681 H(3-0)

Geophysical Interpretation
Analysis and integration of geophysical and ge
tological data. Qualitative and quantitative interpreta
tion. Industrial case studies.

Geophysics 551 H(3-3)

Seismic Theory and Methods
Seismic wave propagation theory; various tech
iques of exploration seismology.

Geophysics 557 H(3-3)

Earthquake Source Analysis
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 and Applied Mathematics 415.

Geophysics 559 H(3-3)

Environmental Applications of Geophysics
Application of geophysical methods such as resistivity, electromagnetics, and ground penetrat-
ing 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 281 or Applied Mathematics 217 and completion of 9.5 FCE in Science or Engineering.

Antirequisite(s): Credit for Geophysics 565 and either 365 or 465 will not be allowed.

Graduate Courses
Graduate students are urged to read the Geosci
cence Department section in the Graduate Studies calendar.

Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geophysics 645 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 or consent of the Department.

Geophysics 649 H(3-3)

Geology 649

Advanced Petrophysical Techniques
Application of petrophysical well logs and their relation to cores, cuttings, fluids and seismicograms. Case studies applied to petroleum exploration and exploita
tion.

Prerequisite(s): Consent of the Department.

Geophysics 653 H(3-0)

Electromagnetic and Induced Polarization
Topics in electromagnetic and induced polarization exploration as applied to the search for metallic minerals.

Geophysics 657 H(3-3)

Seismic Signal Analysis
Advanced methods of seismic data analysis in exploration and production geophysics. Topics include velocity analysis, polarization filtering, me

Prerequisite(s): Geophysics 555, 559, Mathemat
ics 331 and Applied Mathematics 415. and Mathematics 331.

Geophysics 659 H(3-3/2)

Environmental Applications of Geophysics
Application of geophysical methods such as resistivity, electromagnetics, and ground penetrat-
ing 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 281 or Applied Mathematics 217 and completion of 9.5 FCE in Science or Engineering.

Antirequisite(s): Credit for Geophysics 565 and either 365 or 465 will not be allowed.

Graduate Courses
Graduate students are urged to read the Geosci
cence Department section in the Graduate Studies calendar.

Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geophysics 645 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 or consent of the Department.

Geophysics 649 H(3-3)

Geology 649

Advanced Petrophysical Techniques
Application of petrophysical well logs and their relation to cores, cuttings, fluids and seismicograms. Case studies applied to petroleum exploration and exploita
tion.

Prerequisite(s): Consent of the Department.

Geophysics 653 H(3-0)

Electromagnetic and Induced Polarization
Topics in electromagnetic and induced polarization exploration as applied to the search for metallic minerals.

Geophysics 657 H(3-3)

Seismic Signal Analysis
Advanced methods of seismic data analysis in exploration and production geophysics. Topics include velocity analysis, polarization filtering, me

Prerequisite(s): Geophysics 555, 559, Mathemat
ics 331 and Applied Mathematics 415. and Mathematics 331.

Geophysics 659 H(3-3/2)

Environmental Applications of Geophysics
Application of geophysical methods such as resistivity, electromagnetics, and ground penetrat-
ing 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 281 or Applied Mathematics 217 and completion of 9.5 FCE in Science or Engineering.

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Graduate Courses
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Geophysics 649 H(3-3)

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Prerequisite(s): Consent of the Department.

Geophysics 653 H(3-0)

Electromagnetic and Induced Polarization
Topics in electromagnetic and induced polarization exploration as applied to the search for metallic minerals.

Geophysics 657 H(3-3)

Seismic Signal Analysis
Advanced methods of seismic data analysis in exploration and production geophysics. Topics include velocity analysis, polarization filtering, me

Prerequisite(s): Geophysics 555, 559, Mathemat
ics 331 and Applied Mathematics 415. and Mathematics 331.

Geophysics 659 H(3-3/2)

Environmental Applications of Geophysics
Application of geophysical methods such as resistivity, electromagnetics, and ground penetrat-
### Courses of Instruction

- **Geophysics 669**  
  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):** Basic knowledge of seismic wave theory, Fourier analysis and vector calculus. Students should be enrolled in the graduate program in geophysics or receive consent of the instructor.

- **Geophysics 671**  
  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):** Knowledge of linear algebra and vector calculus, and some familiarity with statistics. Also, students should be enrolled in the graduate program in geophysics or receive consent of the instructor.

- **Geophysics 673**  
  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):** Geophysics 671 or consent of the instructor.

- **Geophysics 681**  
  (Geomatics Engineering 681)  
  H(3-0)  
  **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**  
  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**  
  H(3-3)  
  **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 699**  
  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.  
  **MAY BE REPEATED FOR CREDIT**

- **Geophysics 701**  
  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**  
  H(0-6)  
  **Readings in Geophysics**  
  Open only to graduate students in the Department of Geoscience.

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### German Courses

- **German GERM**  
  **Updated**

- **Instruction offered by members of the Department of Germanic, Slavic and East Asian Studies in the Faculty of Arts. Students are encouraged to consult the Department website (http://gsea.ucalgary.ca) for more details on course descriptions and titles of topics courses.**

- **Department Head – F. Strzelczyk**

### Graduate Courses

- **German 627**  
  H(3S-0)  
  **Seminar in German Literature and Culture**  
  Selected topics in literary history.  
  **MAY BE REPEATED FOR CREDIT**

- **German 629**  
  H(3S-0)  
  **Seminar in German Language and Linguistics**  
  MAY BE REPEATED FOR CREDIT

- **German 631**  
  H(3S-0)  
  **Seminar in German Language Pedagogy**  
  MAY BE REPEATED FOR CREDIT

- **German 696**  
  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**

- **Geography 699**  
  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 Courses

- **Greek GREEK**  
  **Instruction offered by members of the Department of Greek and Roman Studies in the Faculty of Arts. Department Head – H. Sigismund Nielsen**

### Graduate Courses

- **Greek 607**  
  Q(0-1T)  
  **Directed Studies**  
  MAY BE REPEATED FOR CREDIT

- **Greek 601**  
  H(3S-0)  
  **Graduate Seminar**  
  MAY BE REPEATED FOR CREDIT

### History Courses

- **History HTST**  
  **Instruction offered by members of the Department of History in the Faculty of Arts. Department Head – W.M. Eloffson**

### Undergraduate Courses

- **History 503**  
  H(3S-0)  
  **Topics in East Asian History**  
  Topics may include Japanese and Chinese responses to western culture and expansion, ideas, politics.  
  **Prerequisite(s):** One of East Asian Studies 317, East Asia 300, History 209, 301, 315, 317, 405, 407.01, 407.02, 407.03, or consent of the Department.  
  **MAY BE REPEATED FOR CREDIT**

- **History 505**  
  H(3S-0)  
  **History of Western Monasticism from 600 to 1500**  
  The history of monastic spirituality in Western Europe. The origins, nature, and various forms of monasticism and their evolution from the Benedictine to the Friar in the context of the commercial revolution.  
  **Prerequisite(s):** History 319 or 321, or consent of the Department.

- **History 506**  
  H(3S-0)  
  **The Century of the Black Death: Economy, Society and Religion**  
  A global examination of the fourteenth-century crises: famine, epidemics, civic unrest, warfare, and Papal politics. Selected topics will lead to the comparative study of the period from England,
France, Italy and the Holy Roman Empire, with a critical assessment of the impact of the Black Death on late medieval society.

**Prerequisite(s):** History 319 or 321 or, consent of the Department.

History 507  H(3S-0)

**Gender and Sexuality in Modern Europe**

An overview of gender theory in modern European history, with emphasis on issues of sexuality.

**Prerequisite(s):** A European History course at the 300 or 400 level or consent of the Department.

History 508  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):** One of History 307, 333, 375, 381, 383, 411.02, 413.02, 483, 485, 490, 491, or consent of the Department.

MAY BE REPEATED FOR CREDIT

History 509  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 323 or 325 or 327, or consent of the Department.

MAY BE REPEATED FOR CREDIT

History 511  H(3S-0)

**The Age of Enlightenment and the Era of Revolution and Napoleon**

Selected themes from the Enlightenment to revolution including the imperial experience in France and Europe in the eighteenth and nineteenth centuries.

**Note:** Not open to students with credit in any one or both of History 511.01 and 511.02.

History 515  H(3S-0)

**History of the Holocaust**

Nazi persecution and destruction of the European Jews during World War II. Topics will include: the roots of modern anti-Semitism; Nazi policy towards the Jews of Germany in the 1930s; the Nazi “New Order” in occupied Europe; the technology of murder; Jewish resistance; the attitudes/actions of occupied peoples and Allied governments; the war crimes trials.

**Prerequisite(s):** History 333 or 413.02, or consent of the Department.

History 517  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.

History 519  H(3S-0)

**Canada from Laurier to Pearson**

Political developments in Canada from 1896-1968, with emphasis on the national scene.

**Prerequisite(s):** History 337 or 351, or consent of the Department.

History 520  H(3S-0)

**Strategic Studies 613**

**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.

History 521  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.

History 523  H(3S-0)

**Topics in Alberta History**

Selected topics in Alberta history with emphasis upon the use of local archival sources.

MAY BE REPEATED FOR CREDIT

History 525  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.

MAY BE REPEATED FOR CREDIT

History 526  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 349 or History 431, and consent of the Department

History 527  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):** One course in Canadian History and consent of the Department.

History 529  H(3S-0)

**Topics in Native History**


MAY BE REPEATED FOR CREDIT

History 531  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.

History 533  H(3S-0)

**Gender History in Canada**

The history of women’s diverse experience in Canada will be examined through the study of aboriginal, immigrant, working-class and farm women.

History 535  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 359 or 361, or consent of the Department.

MAY BE REPEATED FOR CREDIT

History 541  H(3-0)

**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):** At least one of the following courses: History 371, 373, 477.01 or 477.02.

MAY BE REPEATED FOR CREDIT

History 543  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):** One of History 483, 485, 489, 491.01, 491.02, or consent of the Department.

History 545  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 18th century to the 20th century; evolution of tactics in World War I; development of military medicine; innovation in European armies; colonial wars.

**Prerequisite(s):** One of History 349, 379, 381, 383, 431, 471, 481, 483, 485, 489, 491, or consent of the Department.

MAY BE REPEATED FOR CREDIT

History 565  H(3S-0)

**Slavery in Latin America and the Caribbean, 1452–1888**

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.

History 569  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.
Courses of Instruction

**The United States and the World since 1890**
An examination of crucial issues in Canada's political, economic, social and cultural history.
MAY BE REPEATED FOR CREDIT

History 623 H(3-0)
Topics in Canadian History

History 633 H(3-0)
Topics in Modern European History
MAY BE REPEATED FOR CREDIT

History 637 H(3-0)
Topics in Military History
MAY BE REPEATED FOR CREDIT

History 639 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 H(3-0)
Topics in Medieval or Early Modern European History
MAY BE REPEATED FOR CREDIT

History 645 H(3-0)
Topics in U.S. History
MAY BE REPEATED FOR CREDIT

History 647 H(3-0)
Topics in Latin American History
MAY BE REPEATED FOR CREDIT

History 651 H(3S-0)
Reading Seminar

History 653 H(3S-0)
Research and Methods Seminar

History 655 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 H(3-0)
Topics in Legal History
MAY BE REPEATED FOR CREDIT

History 675 H(3-0)
Selected Topics in History
MAY BE REPEATED FOR CREDIT

History 690 H(3-0)
Historiography and the Theories of History

History 691 H(3-0)
Conference Course in Special Topics

History 791 H(3S-0)
Conference Course in Special Topics (Advanced Level)

History 795 H(3S-0)
Advanced Seminar in Historiographical Interpretations

History 797 H(3S-0)
Advanced Seminar in Historical Research

**Human Resources and Organizational Dynamics**

**HROD**

Instruction offered by members of the Haskayne School of Business.

**Graduate Courses**

Human Resources and Organizational Dynamics 601 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 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 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.

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 H(3-1)
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.
Courses of Instruction

**Human Resources and Organizational Dynamics 725**
Application of knowledge of organizational theory and behavior 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.

**Human Resources and Organizational Dynamics 727**
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.

**Human Resources and Organizational Dynamics 729**
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.

**Human Resources and Organizational Dynamics 731**
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.

**Human Resources and Organizational Dynamics 741**
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**
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**
Intensive study and discussion of current literature, research and issues with respect to selected topics in the management of human resources.

**Human Resources and Organizational Dynamics 793**
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.

**Human Resources and Organizational Dynamics 797**
Advanced Seminar in Human Resources and Organizational Dynamics

**PhD Course**

**Doctoral Seminars in Human Resources and Organizational Dynamics**

**Interventional Health Education IPHE**

**Undergraduate Courses**

**Interprofessional Health Education 503**
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.

**Interprofessional Health Education 501**
Course topics focusing on interprofessional practice amongst health science professions.

**Interprofessional Health Education 601**
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.

**Interprofessional Health Education 603**
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.

**Interprofessional Health Education 605**
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.

**Interprofessional Health Education 501**
Course topics focusing on interprofessional practice amongst health science professions.

**Interprofessional Health Education 603**
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.

**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.

**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.

**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.
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinesiology 606</td>
<td>Practical Skills for Applied Exercise Physiology</td>
<td>To develop practical skill and techniques associated with applied exercise physiological measurement vs. measurements in the areas of body composition, cardio-respiratory and musculoskeletal fitness. Prerequisite(s): Admission to a Graduate Program in Kinesiology.</td>
</tr>
<tr>
<td>Kinesiology 609</td>
<td>Statistical Techniques in Kinesiology</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 611</td>
<td>Research Methods in Kinesiology</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 615</td>
<td>Seminar in Applied Exercise Physiology I</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 617</td>
<td>Seminar in Applied Exercise Physiology II</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 637</td>
<td>Nutrition for Physically Active Populations</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 663</td>
<td>Advanced Biomechanics</td>
<td>Theoretical and applied aspects of biomechanics in the acquisition and performance of sport skills. Prerequisite(s): Admission to a Graduate Program in Kinesiology.</td>
</tr>
<tr>
<td>Kinesiology 673</td>
<td>Exercise Physiology</td>
<td>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 473 and admission to a Graduate Program in Kinesiology.</td>
</tr>
<tr>
<td>Kinesiology 703</td>
<td>Special Topics</td>
<td>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; Sport and Exercise Psychology; Sport History; Sport Medicine; Sport Sociology. Prerequisite(s): Admission to a Graduate Program in Kinesiology.</td>
</tr>
<tr>
<td>Kinesiology 715</td>
<td>Seminar in Clinical and Applied Exercise Physiology</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 773</td>
<td>Integrative Exercise Physiology</td>
<td>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.</td>
</tr>
<tr>
<td>Kinesiology 775</td>
<td>Clinical Exercise Physiology</td>
<td>Exercise for clinical populations: exercise assessment and prescription for disease modification. Prerequisite(s): Kinesiology 773 and admission to a Graduate Program in Kinesiology.</td>
</tr>
<tr>
<td>Kinesiology 785</td>
<td>Training Strategies for Health and Sport</td>
<td>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.</td>
</tr>
</tbody>
</table>
Courses of Instruction

Language LANG
Instruction and services offered by the Department of Linguistics, French, Italian and Spanish, Germanic, Slavic and East Asian Studies in the Faculty of Arts and the Faculty of Education. For program information please contact one of the Faculties of Arts and Education.

Graduate Courses

Law 601 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 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, on line chat discussion, and videoconferencing as tools in language teaching/learning; students will also learn to create their own web sites and web activities for teaching.
Prerequisite(s): Consent of the home department.

Law 625 H(3-0)

Research Seminar in Second Language Learning
Centered 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 Greek and Roman Studies in the Faculty of Arts. Department Head – H. Sigismund Nielsen
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 413, 525. Enrolment in any high level Latin course requires a grade of at least "C-" in the prerequisite course(s), or consent of the Department. Latin 205, 207 are alternatives to Latin 201, 203, and are designed primarily for Science and Engineering students.

Graduate Course

Latin 601 H(3S-0)
Graduate Seminar
MAY BE REPEATED FOR CREDIT

Law LAW
Instruction offered by members of the Faculty of Law.

600-Level Courses

Law 601 H(3-0)(3 credits)
Advanced Criminal Law
Examination of selected substantive areas of criminal law. Topics may include double jeopardy, police entrapment, conspiracy, corporate crime, theft, impaired driving and breathalyzer offences, plea negotiations, ethical issues, mistake of law as a defence, and juveniles and the criminal process.
Corequisite(s): Prerequisite or Corequisite: Law 511.

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)(2 credits)
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 611 (formerly Law 639) H(3-0)(3 credits)
Dispute Resolution III: Adjudication
An overview of the binding, third-party decision making process of dispute resolution, and their commonalities and differences. The focus is on two for the following three adjudication processes: arbitrations, administrative hearings and trials.
Note: This course is graded CR, D or F.

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 (fords, 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)
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, as well as 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, 533 and 598.

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.
Courses of Instruction

Courses of Instruction

Law 625  H(3-0)(3 credits)

Intellectual Property Transactions
The intellectual property transactions and strategies in a variety of industries in energy, 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 chemical agreements liability regimes, and shared resources.
Corequisite(s): Prerequisite or Corequisite: Law 549.

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.
Prerequisite(s): 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 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 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 673  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 677  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 687  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.
Courses of Instruction

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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 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 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.

Law 703 H[3-0](3 credits)
Graduate Seminar in Legal Research & 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 Coordinator, 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 Coordinator. In the event of disagreement between the supervisor and the other appointee, the Graduate Coordinator 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.
**Linguistics LING**

Instruction offered by members of the Department of Linguistics in the Faculty of Arts.

Department Head - E. Ritter

**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.

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**Linguistics 600**

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**

Field Methods

Prerequisite(s): Consent of the Department.

**MAY BE REPEATED FOR CREDIT**

**Linguistics 611**

Advanced Syntactic Analysis I

Prerequisite(s): Linguistics 511 or consent of the Department.

**Linguistics 613**

Advanced Phonological Analysis I

Prerequisite(s): Linguistics 403.

**Linguistics 631**

Topics in Linguistic Theory

Seminar in any area of theoretical linguistics, including phonetics, phonology, morphology, syntax, and semantics.

**Linguistics 633**

Topics in Language Acquisition

Seminar in language acquisition.

**Linguistics 635**

Analysis of a Language or Language Family

Seminar in the analysis of a selected language or language family

Prerequisite(s): Consent of the Department.

**MAY BE REPEATED FOR CREDIT**

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**Management Information Systems MGIS**

Instruction offered by members of the Haskayne School of Business.

Management Information Systems Chairperson — V. Mitchell

**Graduate Courses**

**Management Information Systems 601**

Management Information Systems

The fundamental role of information systems (IS) and Information Technologies in leading and managing effective organizations. Strategic, tactical and operational aspects of IS are covered, focusing on their impact on managerial decision processes across a range of business contexts. Topics highlight the development, control, impact and evaluation of IS activities from the individual to the societal level of analysis.

**Management Information Systems 725**

**e-Technology**

Technical and managerial issues related to buying, building, and implementing e-technology to enable various organizational and business strategies and relationships including business-to-business, business-to-customer, business-to-employee and employee-to-employee strategies. Topics include: systems interntetworking, information management, systems integration, wireless technologies, transmission security and authentication, project management, software design, technology diffusion and evaluation, technology-enabled business process design, and legal and ethical issues.

Prerequisite(s): Management Information Systems 601.

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**Management Information Systems 735**

Systems Analysis and Design

Planning and implementation of network-enabled (i.e. Intranet and Internet) solutions to facilitate information and knowledge transfer across business environments. Reflects the information explosion of recent years, the new technological advances in information systems, and the exponential growth in electronic business processes. Course emphasis is placed on the management of technology-enabled business processes.

Prerequisite(s): Management Information Systems 601.

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**Management Information Systems 773**

Enterprise Data Management

Data systems, technologies and management issues associated with information design, capture, storage, search, and dissemination to various stakeholders of an organization. Includes database management technologies, data modelling tools, interface design, structured query language, document and knowledge management systems, and information backup, security and disaster recovery. Brief aspects of the course explore linkages with Internet-based technologies, design issues, web services, search strategies and telecommunication systems for information delivery (wireless and wired; Intranet, extranet, and Internet).

Prerequisite(s): Management Information Systems 601.

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**Management Information Systems 743**

Management Information Systems

The role of the Internet in organizations. Management Information Systems 601.

Prerequisite(s): Management Information Systems 601.

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**Management Information Systems 797**

PhD Course

Prerequisite(s): Management Information Systems 799.

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**PhD Course**

Prerequisite(s): Management Information Systems 799.
Management Studies MGST

Instruction offered by members of the Haskayne School of Business.

Graduate Courses

Management Studies 611 H(3-0)

Managerial Economics
Introduction to economic models for business decision making. Models from microeconomics are applied to provide insights into understanding costs, pricing, industry structure, and competitive interactions. 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 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 701 H(3-0)

Research Methods in Management
Research design and techniques in management that will prepare students to conduct their research projects.

Management Studies 715 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 both Management Studies 715 and 615 will not be allowed.

Management Studies 741 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 benchmarking 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 or equivalent.

Management Studies 743 H(3-0)

International Logistics
The management functions of physical distribution, procurement and production are examined in a global context. International purchasing and logistics activities, global sourcing and production, and supply chain management to provide excellent, cost-effective service on a world-wide basis. Both theoretical and practical approaches are applied.

Prerequisite(s): Operations Management 601 or equivalent.

Management Studies 751 H(3-0)

Global Energy Finance and Accounting

Prerequisite(s): Accounting 603 and Finance 601.

Management Studies 761 (formerly Finance 789.02) 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 or equivalent.

Note: May not be used as part of a student’s major in Finance.

PhD Courses

Management Studies 773 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 H(3-0)

Philosophy of Science in Management Studies
Historical and critical perspectives of classical issues in philosophy of science, nature of scientific explanation, verification of scientific theories, theories of truth, distinctions between science and non-science.

Prerequisite(s): Consent of the Haskayne School of Business.

Management Studies 783 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 H(3S-0)

Seminar in Management Studies
Intensive study and discussion of current literature and research with respect to selected topics in Management Studies.

MAY BE REPEATED FOR CREDIT

Management Studies 790 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 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 F(1-2)

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 or equivalent.

Management Studies 793 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.
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td><strong>Management Studies 797</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Directed Graduate Study in Management</strong></td>
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<tr>
<td>Coverage of various topics on the basis of student and faculty interest.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Consent of the Haskayne School of Business</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td><strong>Management Studies 799</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Topics in Management Studies</strong></td>
<td></td>
</tr>
<tr>
<td>Coverage of various topics on the basis of student and faculty interests.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Consent of the Haskayne School of Business</td>
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<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</table>

#### Manufacturing Engineering ENMF

Instruction offered by members of the Department of Mechanical and Manufacturing Engineering in the Schulich School of Engineering.

**Department Head:** R. Hugo

**Director (Manufacturing Engineering Program):** L. Sudak

**Director (Graduate Program, Mechanical and Manufacturing Engineering):** A. Ramirez-Serrano

### Graduate Courses

#### Manufacturing Engineering 601

Artificial Intelligence Applications in Manufacturing

- Artificial intelligence; expert systems, system components and architecture, knowledge representation, search techniques, uncertainty; AI planning, problem representation, solution methods; programming languages and expert system shells for developing expert systems; introduction of neural networks, basic neuron model, multilayer perception, self-organizing networks, adaptive resonance memory. Applications to design, manufacturing planning and robotics.

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<tr>
<th>Credits</th>
<th>H(3-0)</th>
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#### Manufacturing Engineering 605

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.

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<tr>
<th>Credits</th>
<th>H(3-0)</th>
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#### Manufacturing Engineering 607

Total Quality Management


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<th>Credits</th>
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</table>

#### Manufacturing Engineering 609

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.

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<tr>
<th>Credits</th>
<th>H(3-0)</th>
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</table>

#### Manufacturing Engineering 611

Multi-Agent Systems

- Historical background; types and definitions of agents; knowledge representation and reasoning; agent theories, architectures and languages; possible world model and alternatives; symbolic, reactive and hybrid architectures; agent communication; coordination, cooperation, negotiation and planning; agent frameworks; example multi-agent systems are considered throughout the course.

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<tr>
<th>Credits</th>
<th>H(3-0)</th>
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#### Manufacturing Engineering 613

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.

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<th>Credits</th>
<th>H(3S-0)</th>
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#### Manufacturing Engineering 617

Real-time Distributed Control Systems

- Shop floor control systems. Programmable logic controller (PLC) concepts, languages and models (e.g., IEC 61131-3). Real-time distributed control models (e.g., IEC 61499, RT-UML). Intelligent control: real-time distributed control system design; safety-critical system issues; reconfiguration issues.

<table>
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<tr>
<th>Credits</th>
<th>H(3-0)</th>
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#### Manufacturing Engineering 619

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.

<table>
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<tr>
<th>Credits</th>
<th>H(3-0)</th>
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### Manufacturing Engineering 713

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.

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<tr>
<th>Credits</th>
<th>H(3S-0)</th>
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</table>

### 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.

<table>
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<tr>
<th>Credits</th>
<th>H(3S-0)</th>
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</table>

### 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).

Each 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.

#### 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.
Prerequisite(s): Study of factors influencing buyer decision-making.

Buyer Behaviour

Marketing 601 H(3-0)

Marketing 763 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 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.

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 795 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 H(3-0)
Advanced Seminar in Marketing
Prerequisite(s): Consent of the Haskayne School of Business.
MAY BE REPEATED FOR CREDIT

PhD Course
Marketing 799 H(3S-0)
Doctoral Seminars in Marketing
MAY BE REPEATED FOR CREDIT

Mechanical Engineering ENME

Instruction offered by members of the Department of Mechanical and Manufacturing Engineering in the Schulich School of Engineering.
Department Head – R. Hugo
Director (Mechanical Engineering Program) - L. Sudak
Director (Graduate Program, Mechanical and Manufacturing Engineering) – A. Ramirez-Serrano

Graduate Courses

Mechanical Engineering 603 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 H(3-0)
Combustion Processes

Mechanical Engineering 607 H(3-0)
Mechanics of Compressible Flow

Mechanical Engineering 613 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 H(3-0)
Instrumentation
The main topics covered are commonly used techniques for the measurement of temperature, pressure, velocity, mass-flow, concentration in binary and other mixtures, heat transfer rate and heat flux, calorific value of fuels, viscosity, thermal conductivity and diffusion coefficients. In addition, attention is given to flow visualization techniques and to the recording and handling of experimentally obtained data by various means including automatic recorders, high-speed photography and analog-to-digital data converters.
<table>
<thead>
<tr>
<th>Courses of Instruction</th>
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</thead>
<tbody>
<tr>
<td><strong>Mechanical Engineering 619</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Special Problems</strong></td>
<td></td>
</tr>
<tr>
<td>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.</td>
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<tr>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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<tr>
<td><strong>Mechanical Engineering 625</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Unsteady Gas Dynamics</strong></td>
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<tr>
<td>Origins of unsteady flow; one-dimensional unsteady flow in pipes and ducts; simplified method of analysis, method of characteristics; boundary conditions for method characteristics analyses; graphical and numerical procedures for solving the characteristics equations; application of solution techniques for practical problems; pressure exchangers and other devices utilizing unsteady flow.</td>
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<tr>
<td><strong>Mechanical Engineering 629</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Fuel Science and Technology</strong></td>
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<tr>
<td><strong>Mechanical Engineering 631</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Numerical Methods for Engineers</strong></td>
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<tr>
<td>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 form, Gaussian 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 ( \Delta^2 ) 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.</td>
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<tr>
<td><strong>Mechanical Engineering 633</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Mathematical Techniques for Engineers</strong></td>
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<tr>
<td>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.</td>
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<tr>
<td><strong>Mechanical Engineering 637</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>(Environmental Engineering 673)</strong></td>
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<tr>
<td><strong>Thermal Systems Analysis</strong></td>
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<tr>
<td>Fundamentals of thermodynamics, fluid mechanics and heat transfer studies in particular areas, heat exchangers, co-generation; Second law of thermodynamics and concept of entropy generation and thermo-economics; Environmental issues and pollution control; Renewable energy systems; Co-generation design; Heat exchanger design; Energy storage systems; Optimization process.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Engineering 311 and Energy and Environment, Engineering 311 or equivalent.</td>
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<tr>
<td><strong>Mechanical Engineering 639</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Numerical Methods for Computational Fluid Dynamics</strong></td>
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<tr>
<td><strong>Mechanical Engineering 641</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Advanced Control Systems</strong></td>
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<tr>
<td>Introduction to multivariable systems; state space models; analysis; stability; Cayley-Hamilton theorem; controllability and observability; state feedback control; pole placement designs; introduction to linear optimal control and estimation; Kalman filter; separation theorem and duality; performance specifications; controller reduction concepts; introduction to robust control.</td>
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<tr>
<td><strong>Mechanical Engineering 643</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Optimal and Adaptive Control</strong></td>
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<tr>
<td>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 theoretical performance specification; robust stability and robust performance objectives; Khartonov stability.</td>
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<tr>
<td><strong>Mechanical Engineering 645</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Robotics and Vision Systems</strong></td>
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<tr>
<td>An introduction to robotics. Kinematics, statics, dynamics, and control of robot arms. Digital image processing and robot vision. Robot programming and applications. Project: design of mechanisms or software related to these topics.</td>
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<tr>
<td><strong>Mechanical Engineering 647</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Combustion in Gas Turbines</strong></td>
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<tr>
<td>Basic design features of combustion chambers, their types and requirements for aero and industrial applications; combustion fundamentals relevant to gas turbines; aerodynamics; fuel types and fuel injection systems; ignition, flame stabilization, heat transfer, combustion efficiency and how they affect performance and emissions.</td>
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<tr>
<td><strong>Mechanical Engineering 650</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Mobile Robotics</strong></td>
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<tr>
<td><strong>Prerequisite(s):</strong> Mechanical Engineering 645, or equivalent.</td>
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</tr>
<tr>
<td><strong>Mechanical Engineering 653</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Continuum Mechanics in Engineering</strong></td>
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<tr>
<td>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 continuous thermo-mechanics and constitutive theory; isotropic and anisotropic hyperelasticity; composite materials.</td>
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<tr>
<td><strong>Mechanical Engineering 655</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Analysis of Shells and Plates</strong></td>
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<tr>
<td>General linear and nonlinear equations of the theories of thin shells. Approximate, membrane, and shallow shell theories. Plates as special cases of the shell. Finite elements for plates and shells. Stability and optimum design of plates and shells. Stress concentrations and local loads. Large deflections and limit loads. Applications to the design of pipelines, large containers, pressure vessels, and other mechanical structures.</td>
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<tr>
<td><strong>Mechanical Engineering 661</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Corrosion Science</strong></td>
<td></td>
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<tr>
<td><strong>Mechanical Engineering 663</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>(Medical Science 663)(Kinesiology 663)</strong></td>
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<tr>
<td><strong>Advanced Biomechanics</strong></td>
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<tr>
<td>Theoretical and applied aspects of biomechanics in the acquisition and performance of sport skills.</td>
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<tr>
<td><strong>Prerequisite(s):</strong> Consent of the Faculty.</td>
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<tr>
<td><strong>Mechanical Engineering 665</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Elements of Materials Engineering</strong></td>
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<tr>
<td>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. Fundamental statistical 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.</td>
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<tr>
<td><strong>Mechanical Engineering 667</strong></td>
<td>H(3-0)</td>
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<tr>
<td><strong>Fracture Mechanics</strong></td>
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<tr>
<td>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.</td>
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<tr>
<td><strong>Mechanical Engineering 669</strong></td>
<td>H(3-0)</td>
</tr>
<tr>
<td><strong>Fatigue of Materials</strong></td>
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</tbody>
</table>
Courses of Instruction

Medical Physics MDPH

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Department Head - R.I. Thompson.

Graduate Courses

Medical Physics 623 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 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 633 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 H(3-0)

Anatomy and Statistics for Medical Physicists
Anatomy, physiology, probability, statistical inference, hypothesis testing, regression models, clinical trials, survival analysis.

Prerequisite(s): Medical Physics 623 and consent of the Department.

Medical Physics 639 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 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 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 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 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 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 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.
## Courses of Instruction

### Medical Science MDSC

Instruction offered by members of the Faculty of Medicine.

### Undergraduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisites</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Science 501</td>
<td>H(3-0)</td>
<td>(Biology 501)</td>
<td>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 Faculty.</td>
</tr>
<tr>
<td>Medical Science 503</td>
<td>H(3-0)</td>
<td>(Biology 503)</td>
<td>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.</td>
</tr>
<tr>
<td>Medical Science 507</td>
<td>H(3-3)</td>
<td></td>
<td>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 (USE) before a student can be registered. Prerequisite(s): Consent of the BHSc Honours Department. MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Medical Science 508</td>
<td>2xF(0-6)</td>
<td></td>
<td>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. Culminates with a Research Symposium Day during which students present and defend their research before an audience of peers and mentors, share their research with the faculty and staff at large through poster presentations and submit a written research thesis. Prerequisite(s): Enrolment in the BHSc Honours program and Health and Society 408 or Medical Science 408 or approval of the Department. Note: This course is worth 2.0 FCE and is only offered over two sessions.</td>
</tr>
<tr>
<td>Medical Science 509</td>
<td>H(3-3)</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Medical Science 511</td>
<td>H(3-0)</td>
<td></td>
<td>Instrumental Analysis: An overview of the analytical laboratory instruments used in research and the diagnosis and treatment of human disease.</td>
</tr>
<tr>
<td>Medical Science 515</td>
<td>H(3-0)</td>
<td>(Biology 515)</td>
<td>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 351 or Medical Science 351.</td>
</tr>
<tr>
<td>Medical Science 528</td>
<td>F(0-6)</td>
<td></td>
<td>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 (USE) before a student can be registered. Prerequisite(s): Consent of the BHSc Department. MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Medical Science 541</td>
<td>H(3-1T)</td>
<td></td>
<td>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 Faculty. Note: Lectures run concurrently with Medical Science 641.01.</td>
</tr>
<tr>
<td>Medical Science 543</td>
<td>H(3-0)</td>
<td></td>
<td>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 permission of the instructor. Note: Lectures run concurrently with Medical Science 641.03. Previous completion of Medical Science 541 is suggested but not required.</td>
</tr>
<tr>
<td>Medical Science 545</td>
<td>H(3-0)</td>
<td></td>
<td>Genomics: Prerequisite(s): Medical Science 341 or Biology 311 or consent of the Faculty. Note: Lectures run concurrently with Medical Science 641.04.</td>
</tr>
<tr>
<td>Medical Science 561</td>
<td>H(3-0)</td>
<td>(Cellular, Molecular and Microbial Biology 561)</td>
<td>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 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.</td>
</tr>
</tbody>
</table>

### Graduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Science 603</td>
<td>H(3-1)</td>
<td>(Biology 603)</td>
</tr>
<tr>
<td>Medical Science 604</td>
<td>F(3-3)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 605</td>
<td>H(3-0)</td>
<td>(Computer Science 605)</td>
</tr>
</tbody>
</table>
Courses of Instruction

Medical Science 609 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 both Medical Science 609.01 and 607.01 will not be allowed. Note: Credit for both Medical Science 609.02 and 751.14 will not be allowed.

Medical Science 612 F(3-1S)
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 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 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

Note: Enrolment is open to all MDNS graduate students. Consent of instructor is required for all other graduate students. Not open to undergraduates.

Medical Science 621 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 623 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 627 H(3-0)
Endocrinology
Normal endocrine physiology and biochemistry. Mechanisms and principles of departure from normal endocrine homeostasis.

627.03. Selected Topics in Advanced Endocrinology

Prerequisite(s): Zoology 597 or consent of the Faculty.

Medical Science 629 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 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 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 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. In doing so, makes use of lectures, readings, video tapes, case discussions, and current research.

Prerequisite(s): Consent of the Faculty.

Medical Science 637 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 on-line through Blackboard. 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 coordinator 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 H(3-0)
Mucosal Pathophysiology
An independent study course that 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. Also involves independent research on the part of the students, small group tutorials, written assignments and laboratory exercises. The course will be divided into three sections.

Note: Medical Science 637.01 recommended.

Medical Science 639 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.

639.01. Principles of Immunology
639.02. Cellular and Molecular Immunology
639.03. Topics in Immunology
639.04. Inflammation

Prerequisite(s): Consent of the Faculty.

Antirequisite(s): Credit for both Medical Science 639.01 and 755.01 will not be allowed. Credit for both Medical Science 639.02 and 641.01 will not be allowed. Credit for both Medical Science 639.03 and 641.03 will not be allowed. Credit for both Medical Science 639 and 639.04 will not be allowed.
### Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Type</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Science 641</td>
<td>Genetics</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 671</td>
<td>Techniques in Medical Science</td>
<td>H(0-6)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 672</td>
<td>Biotechnology Business Aspects</td>
<td>H(2-0)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 673</td>
<td>Careers in Biotechnology</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 674</td>
<td>Integrated Systems Course</td>
<td>F(3-0)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 675</td>
<td>Bioinformatics Resources for the Biologist</td>
<td>H(2-3T)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 676</td>
<td>Scripting and Database Querying for Molecular Biologists</td>
<td>H(2.5-1)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 677</td>
<td>Directed Study in Biomedical Technology</td>
<td>H(1-6)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 678</td>
<td>Project in Biomedical Technology</td>
<td>H(1-3T)</td>
<td></td>
</tr>
<tr>
<td>Medical Science 683</td>
<td>The Biology and Therapy of Human Cancer</td>
<td>H(3-0)</td>
<td></td>
</tr>
</tbody>
</table>

#### 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.
- **Prerequisite(s):** Consent of the Instructor.
- **Note:** Enrolment is restricted to MDBT graduate students. Consent of instructor(s) is required for all other students.

#### Biotechnology Commercialization
- Technology commercialization is the process of translating research results, scientific discoveries or processes and methods into a commercially useful and profitable product.
- **Prerequisite(s):** Consent of the Faculty.
- **Note:** Enrolment is open to all MDBT graduate students. Consent of instructor(s) is required for all other students.

#### 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):** Consent of the Faculty.
- **Note:** Enrolment is open to all MDBT graduate students. Consent of instructor(s) is required for all other students.

#### Practicum in Biomedical Technology
- A 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):** 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.
- **Note:** Enrolment is restricted to MDBT graduate students.

NOT INCLUDED IN GPA
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Science 685</td>
<td>Biomechanics of Human Movement</td>
<td>H(3-3)</td>
</tr>
<tr>
<td>(Mechanical Engineering 685)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Imaging</td>
<td>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 689.99. Medical Imaging Project</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Medical Science 701</td>
<td>Advanced Topics in Reproductive Health</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>(Veterinary Medicine 701)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Anatomy 703</td>
<td>Human Anatomy: Concepts, Exploration and Teaching</td>
<td>H(2-6)</td>
</tr>
<tr>
<td>Medical Science 706</td>
<td>Theory and Practice of Family Therapy</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Family Therapy Practicum</td>
<td>The development of conceptual and experiential expertise in working therapeutically with families. 707.01. Family Therapy I 707.02. Family Therapy II</td>
<td>H(2S-12)</td>
</tr>
<tr>
<td>Medical Science 707</td>
<td>Theory and Practice of Interprofessional Psychosocial Oncology</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Topics in Mountain Medicine and High Altitude Physiology</td>
<td>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., Altitude Sickness, Acute Mountain Sickness; High Altitude Pulmonary Edema, High Altitude Cerebral Edema), and the pathophysiology underlying these diseases.</td>
<td>H(0-3T)</td>
</tr>
<tr>
<td>Medical Science 721</td>
<td>Biochemistry and Molecular Biology</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Medical Science 734</td>
<td>Qualitative Measurements for Medical Education</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Medical Education</td>
<td>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.</td>
<td>H(1S-4)</td>
</tr>
<tr>
<td>Research Design and Statistics in Medical Education</td>
<td>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.</td>
<td>H(3-1)</td>
</tr>
</tbody>
</table>

### Notes
- Courses of Instruction
- Enrolment is open to interested graduate students in medicine and the mental health professions, all others will require consent of the instructor.
- All other students require permission of instructor.

### Prerequisites
- Consent of the Faculty.
- Credit for more than one of the medical imaging courses is not allowed.
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- Credit for more than one of the medical imaging courses is not allowed.
- Credit for more than one of the medical imaging courses is not allowed.
- Consent of the Faculty.

### Antirequisites
- Biochemistry and Molecular Biology
- Principles of Molecular Biology
- Advanced Molecular Imaging

### Credits
- NOT INCLUDED IN GPA
- Credit for more than one of the medical imaging courses is not allowed.
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- Credit for more than one of the medical imaging courses is not allowed.
- Credit for more than one of the medical imaging courses is not allowed.
- Consent of the Faculty.
Courses of Instruction

Medical Science 737 H(3-0)

Curriculum Design and Evaluation in the Medical Sciences

Instruction offered by members of the Department of Medicine in the Faculty of Arts. Department Head - W. Jordan

Graduate Courses

Medical History and Literature 596 F(1-4)

Honours Project

A major project with an emphasis upon historical and/or cultural issues.

Prerequisite(s): Music History and Literature 305 and consent of the Department.

Music History and Literature 598 F(1-4)

Senior Project

Major project in music history and literature.

Prerequisite(s): Music History and Literature 305 and consent of the Department.

Graduate Courses

Music History and Literature 603 H(38-0)

Pro-Seminar in Music for Graduate Students

Selected works of music from the middle ages to the present in an analytical and historical context.

Prerequisite(s): Consent of the Department.

Music History and Literature 655 H(3-0)

Independent Study

Individual study in an area of musicology.

Prerequisite(s): Consent of the Department.

Music History and Literature 655 H(3-0)

Independent Study

Individual study in an area of musicology.

Prerequisite(s): Consent of the Department.

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Prerequisite(s): Consent of the Department.

Music History and Literature 655 H(3-0)

Independent Study

Individual study in an area of musicology.

Prerequisite(s): Consent of the Department.
Courses of Instruction

Music Performance 634  F(2-3)  
Advanced Instrumental Conducting  
Prerequisite(s): Consent of the Department.

Music Performance 641  H(0-4)  
Advanced Chamber Ensemble I  
Intensive coaching in departmental chamber ensembles.  
Prerequisite(s): Consent of the Department.

Music Performance 643  H(0-4)  
Advanced Chamber Ensemble II  
Continuation of Music Performance 641.  
Prerequisite(s): Music Performance 641 or consent of the Department.

Music Performance 655  H(3-0)  
Independent Study  
Individual study in a selected performance area.  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Performance 657  H(0-3)  
Studies at the Banff Centre  
Advanced music studies. 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.  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Performance 671  H(3-0)  
Topics in Music Performance  
Various topics such as applied music literature, applied pedagogy, accompanying, phonetics and others.  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Performance 691  H(2-3)  
Advanced Performance Practicum I  
Applied instruction in instrument or voice.  
Prerequisite(s): Consent of the Department.

Music Performance 693  H(3-2)  
Advanced Performance Practicum II  
Continuation of Music Performance 691.  
Prerequisite(s): Music Performance 691 or consent of the Department.

Music Theory and Composition MUTC  
Instruction offered by members of the Department of Music in the Faculty of Arts.  
Department Head - W. Jordan  

Undergraduate Courses

Music Theory and Composition 555  H(3-0)  
Independent Study  
Individual study in a selected theory or composition area.  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 575  H(3-0)  
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 Theory and Composition 471, 473, 475, 477, 479 or consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 596  F(1-4)  
Honours Project  
A major project with an emphasis upon analytic or creative issues.  
Prerequisite(s): Two half courses in Music Theory and Composition at the 400 or 500 level; or Music Theory and Composition 493; or consent of the Department.  
Note: Restricted to students in the BA Honours (Music) program.

Music Theory and Composition 598  F(1-4)  
Senior Project  
Major project in theory or composition.  
Prerequisite(s): Two half courses in Music Theory and Composition at the 400 or 500 level; or Music Theory and Composition 493; or consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 655  H(3-0)  
Independent Study  
Individual study in a selected theory or composition area.  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 671  H(3S-0)  
Seminar in Theory and Composition  
Creative and analytic approaches to the study of selected repertoire with an emphasis upon contemporary music.  
Prerequisite(s): One 400-level Music Theory and Composition course or consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 693  F(3-0)  
Graduate Courses  
Advanced Topics in Theory and Composition  
Various topics (masters level).  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 695  H(2-2)  
Composition  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 785  H(3-3)  
Advanced 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 Theory and Composition 795  H(3-0)  
Composition Seminar  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 796  H(3-0)  
Advanced Selected 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 Theory and Composition 865  H(3-3)  
Projects in Computer Music  
Individual and collaborative creative and research projects in computer music.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 875  H(3-0)  
Advanced Topics in Theory and Composition  
Various topics (doctoral level).  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 879  H(3-0)  
Advanced Projects in Computer Music  
Individual and collaborative creative and research projects in computer music.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 711  H(3-0)  
Advanced Music Theory and Composition  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 755  H(3-0)  
Selected Topics in Theory and Composition  
Various topics (masters level).  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 775  H(3-0)  
Composition Seminar  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 795  H(3-0)  
Advanced 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 Theory and Composition 796  H(3-0)  
Composition  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 785  H(3-3)  
Advanced 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 Theory and Composition 865  H(3-3)  
Projects in Computer Music  
Individual and collaborative creative and research projects in computer music.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 875  H(3-0)  
Advanced Topics in Theory and Composition  
Various topics (doctoral level).  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 879  H(3-0)  
Advanced Projects in Computer Music  
Individual and collaborative creative and research projects in computer music.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 711  H(3-0)  
Advanced Music Theory and Composition  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 755  H(3-0)  
Selected Topics in Theory and Composition  
Various topics (masters level).  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 775  H(3-0)  
Composition Seminar  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT  

Music Theory and Composition 795  H(3-0)  
Advanced 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 Theory and Composition 796  H(3-0)  
Composition  
Prerequisite(s): Consent of the Department.  
MAY BE REPEATED FOR CREDIT
Courses of Instruction

Nursing NURS

Instruction offered by members of the Faculty of Nursing.

Graduate Courses

Nursing 601 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 H(156 hours)
Independent Supervised Clinical Practicum
Prerequisite(s): Consent of the Faculty.
MAY BE REPEATED FOR CREDIT

Nursing 605 H(3S-0)
Philosophical Foundations for Advanced Nursing Practice
Exploration of the philosophical foundations of advanced nursing practice. A process of critical analysis and deconstruction of the various conceptual frameworks and paradigms leading to articulation of the philosophical perspectives that guide advanced nursing practice.
Prerequisite(s): Consent of the Faculty.

Nursing 607 H(39 hours)
Independent Guided Study
Prerequisite(s): Consent of the Faculty.
MAY BE REPEATED FOR CREDIT

Nursing 611 H(3-0)
Substantive Theory for Advanced Nursing Practice
Introduction to substantive theory related to advanced nursing practice.
Prerequisite(s): Consent of the Faculty.

Nursing 617 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-expploration of their own beliefs, values, and attitudes about life, illness, death, and dying, and how this self-explosion shapes interactions with those we care for.
Prerequisite(s): Consent of the Faculty.

Nursing 621 H(3S-0)
Health Research Methods: Quantitative Designs
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 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 637 H(3S-0) (formerly Nursing 601.38)
Advancing Practice Through Clinical Education
Exploration and extension of the scholarship of teaching in clinical nursing education in practice and academic settings. Emphasis is on clinical teaching models, teaching/learning strategies, conventional and emerging pedagogies, and educational research that inform and evaluate clinical nursing teaching and learning.
Prerequisite(s): Consent of the Faculty.

Nursing 639 H(3-0) (formerly Nursing 601.41)
Advanced Critical Inquiry: Preceptoring and Leading in Practice-based Disciplines
Focus on the exploration, critical inquiry, analysis and synthesis of the knowledge and practice in preceptoring, mentoring, and leading in clinical settings. The relationships between theory, research, social responsibility, and practice will be addressed through literature on health and education reform, human resource challenges, academic preparation, and learning in dynamic clinical environments.
Prerequisite(s): Consent of the Faculty.

Nursing 641 H(24S-68 within 6-week block)
Nurse Practitioner Practicum I
Opportunity for students to acquire advanced knowledge and skills related to clinical decision-making and client management of commonly presented health problems.
Corequisite(s): Prerequisites or Corequisites: Nursing 661, 663 and 665 or equivalent, 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 F(52S-180 within 6-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 641.
NOT INCLUDED IN GPA

Nursing 646 F(52S-180 within 6-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.
Antirequisite(s): Not open to students with credit in Nursing 648.
NOT INCLUDED IN GPA

Nursing 650 F(16S-292 within 8-week block)
Nurse Practitioner Practicum IV
Consolidation of components of NP role in specialty focus.
Prerequisite(s): Nursing 667 and one of 646 or 648.
NOT INCLUDED IN GPA

Nursing 661 H(3S-0 within 3-week block)
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 H(3S-1)
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 (3SS-30 within 3-week block)
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 judgement, as well as selected diagnostic skills necessary for advanced practice.
Prerequisite(s): Consent of the Faculty.

Nursing 667 H(3S-0 within 3-week block)
Nurse Practitioner Practice Issues and Role Integration
Systems aspects related to management of complex health problems in NP practice, medical-legal and role development in extended practice environment.
Prerequisite(s): Nursing 646 or 648.

Nursing 675 H(2S-1T-12)
Advanced Nursing Practice: MN Thesis and MN/NP
Application of advanced nursing knowledge to practice. Emphasis on evidence based assessment tools and intervention skills for advanced practice with individuals, families, or communities. Development of a conceptual framework that could be used to guide advanced nursing practice or the research project.
Prerequisite(s): Nursing 605 and 611.
Antirequisite(s): Not open to students with credit in Nursing 691.
Note: Open to MN Thesis and MN/NP students only.

Nursing 683 H(3S-0)
Health Research Methods: Qualitative Designs and Analyses
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.
## Courses of Instruction

### Nursing 691
**H(2S-1T-12)**

**Advanced Nursing Practice I**
Application of advanced nursing knowledge to practice in students' area of specialty. Emphasis on applying and evaluating assessment and intervention skills for advanced practice with individuals, families, or communities. Beginning development of a conceptual framework for advanced nursing practice.

**Prerequisite(s):** Nursing 605 and 611.

### Nursing 693
**H(2S-1T-12)**

**Advanced Nursing Practice II**
Extension and application of a conceptual framework for advanced practice in student's specialty area. Further clinical practice in assessments, interventions, and evaluation with individuals, families, or communities.

**Prerequisite(s):** Nursing 691.

### Nursing 695
**H(2S-1T-12)**

**Advanced Nursing Practice III**
Evaluation of how advanced nursing practice provides a new framework for leadership in the clinical and research areas. Development of strategies whereby advanced nursing practice enables clients, their families and communities, including organizations and regions, to design innovative responses across the continuum of care.

**Prerequisite(s):** Nursing 693.

### Nursing 701
**H(3-0)**

**Doctoral Special Topics**
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

### Nursing 705
**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
**H(39 hours)**

**Directed Study**
Prerequisite(s): Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

### Nursing 711
**H(2S-0)**

(formerly Nursing 735)

**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
**H(3-0)**

(formerly Nursing 701.02)

**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
**H(3-0)**

(formerly Nursing 701.23)

**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.

### Nursing 733
**H(2S-0)**

**Doctoral Thesis Seminar**
Opportunity for students to discuss development of their dissertation 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
**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 multi-disciplinary perspective.

**Prerequisite(s):** Consent of the Faculty.

### Nursing 783
**H(3-0)**

(formerly Nursing 701.01)

**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 715
**H(3-0)**

**Management Science Using Spreadsheets**
The modeling 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
**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
**H(3-0)**

**Simulation of Operational Systems**
Computer simulation as a decision-making methodology for all areas of organization. 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
**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 modeling.

**Prerequisite(s):** Operations Management 601 and Management Studies 613.

### Operations Management 797
**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
**H(3S-0)**

**Doctoral Seminars in Operations Management**
799.01. Strategic Research Issues
799.02. Tactical Research Issues
799.03. Operational Research Issues
### Philosophy PHIL

Instruction offered by members of the Department of Philosophy in the Faculty of Arts.

Department Head – A. Kazmi

#### Graduate Courses

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy 601</td>
<td>Seminar in Selected Problems</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 609</td>
<td>Topics in the History of Philosophy</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 623</td>
<td>Topics in Metaphysics</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 627</td>
<td>Topics in the Philosophy of Religion</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 649</td>
<td>Topics in Ethics</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 653</td>
<td>Topics in Social and Political Philosophy</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 661</td>
<td>Topics in Epistemology</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 667</td>
<td>Topics in Philosophy of Science</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 671</td>
<td>Topics in Philosophical Logic and the Philosophy of Language</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 679</td>
<td>Topics in Logic</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 683</td>
<td>Topics in the Philosophy of Mind</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Philosophy 691</td>
<td>Topics in Philosophical Analysis</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
</tbody>
</table>

### Physics PHYS

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Department Head - R.I. Thompson

#### Undergraduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 501</td>
<td>Special Relativity</td>
<td></td>
</tr>
<tr>
<td>Physics 509</td>
<td>Plasma Physics</td>
<td>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.</td>
</tr>
<tr>
<td>Physics 521</td>
<td>Nonlinear Dynamics</td>
<td>Topics: Introduction to nonlinear dynamical systems: Phase space representation, nonlinear oscillators, bifurcations, normal forms, pattern formation, amplitude equations, deterministic chaos, attractors, fractals, synchronization</td>
</tr>
<tr>
<td>Physics 543</td>
<td>Quantum Mechanics II</td>
<td>Theory of angular momentum and applications, perturbation theory and applications. Identical particles. Introduction to relativistic wave equations.</td>
</tr>
<tr>
<td>Physics 561</td>
<td>Stable and Radioactive Isotope Studies, Fundamentals</td>
<td>A multidisciplinary course. Topics include nucleosynthesis, radioactive decay, isotope exchange phenomena, kinetic isotope effects, tracer techniques, molecular spectra and instrumentation.</td>
</tr>
</tbody>
</table>

### Laser Physics

#### Physics 571

Laser Physics

Theoretical aspects of lasing and lasers. Principles of operation of solid-state, liquid, and gas lasers. Applications of laser systems to research, medical, and industrial projects.

**Prerequisite(s):** Physics 443 and 455.

**Note:** Physics 449 is suggested but not required.

### Atmospheric and Environmental Physics

#### Physics 573

Atmospheric and Environmental Physics


**Prerequisite(s):** One of Physics 449 or Chemistry 371 or consent of the Department.

**Antirequisite(s):** Credit for both Physics 573 and Applied Physics 573 will not be allowed.

### Computational Physics III

#### Physics 581

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 381 and 455.

**Note:** A knowledge of a high level programming language (C, C++, Fortran or Pascal) is highly recommended.

### Physics 597

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 497 or 325.

### Physics 598

Research in Physics

Research project in Physics.

**Prerequisite(s):** Physics 443 and 449 and 455 and consent of the Department.

### Physics 599

Independent Study

Each student will be assigned a project in consultation with a tutor. A written report and oral presentation are required.

**Prerequisite(s):** Consent of the Department.

**Note:** This course may be repeated once for credit.
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.

Statistical Physics

Electrodynamics
Interaction between charged particles and the electromagnetic field in relativistic formulation. Scattering and energy losses of charged particles. Radiation by charged particles.

Advanced Quantum Mechanics I

Advanced Quantum Mechanics II
Second quantized description of N-particle systems. Quantum theory of the electromagnetic field, coherent states. Relativistic quantum mechanics.

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.

Quantum and Nonlinear Optics
Fundamentals of quantum and nonlinear optics including atom-photon interactions, coherence, electromagnetically induced transparency, open systems and decoherence, and applications to quantum information technology.
## Courses of Instruction

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 697</td>
<td>Topics in Contemporary Physics</td>
<td>Topics will be from the research areas of staff members.</td>
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<tr>
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<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</tr>
<tr>
<td>Physics 699</td>
<td>Project in Physics</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td><strong>H(0-9)</strong></td>
<td></td>
</tr>
<tr>
<td>Physics 701</td>
<td>Independent Study</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</tr>
<tr>
<td>Political Science 615</td>
<td>Advanced History of Political Thought</td>
<td>An intensive study of selected major political thinkers within the history of political thought.</td>
</tr>
<tr>
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<td><strong>H(3S-0)</strong></td>
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</tr>
<tr>
<td>Political Science 617</td>
<td>Advanced Political Theory</td>
<td>Discussion of contemporary topics in political thought. Emphasis on analysis of problems rather than history of ideas.</td>
</tr>
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<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 619</td>
<td>War and Interpretation</td>
<td>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.</td>
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<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 621</td>
<td>Canadian Political Institutions</td>
<td>Examination of the structure and operation of the central institutions of the Canadian state, including the constitution, federalism, parliamentary government, and political parties.</td>
</tr>
<tr>
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<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 623</td>
<td>Canadian Political Process</td>
<td>Examination of Canadian political behaviour within its institutional context, including political parties, interest groups, voting and socialization. Computer use is optional.</td>
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<tr>
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<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 631</td>
<td>Parties, Elections and Representation</td>
<td>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.</td>
</tr>
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<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 633</td>
<td>US Security Policy</td>
<td>An examination of US security policy, with an emphasis on how US security policy is made and on the main contemporary security issues the US faces today.</td>
</tr>
<tr>
<td>Political Science 641</td>
<td>Selected Topics in Public Law</td>
<td>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.</td>
</tr>
<tr>
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<td><strong>H(3-0)</strong></td>
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<tr>
<td>Political Science 651</td>
<td>Policy Studies</td>
<td>Critical review of major themes, issues, and approaches in the study and evaluation of public policy.</td>
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<td><strong>H(3-0)</strong></td>
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<tr>
<td>Political Science 653</td>
<td>Gender and Public Policy</td>
<td>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.</td>
</tr>
<tr>
<td>Political Science 671</td>
<td>Advanced Comparative Politics: Political Development</td>
<td>Analysis of comparative methods and paradigms of political development.</td>
</tr>
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<td><strong>H(3-0)</strong></td>
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<tr>
<td>Political Science 673</td>
<td>Advanced Comparative Politics: Institutions and Systems</td>
<td>Comparative analysis of political institutions and systems.</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 675</td>
<td>Selected Topics in Advanced Comparative Politics</td>
<td>Selected regions and topics in Comparative Politics.</td>
</tr>
<tr>
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<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
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</tr>
<tr>
<td>Political Science 681</td>
<td>Advanced Analysis of International Relations</td>
<td>Selected issues and approaches in the analysis of world politics.</td>
</tr>
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<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 683</td>
<td>Advanced Studies in Foreign Policy</td>
<td>Selected themes in the formation and implementation of foreign policies.</td>
</tr>
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<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 685</td>
<td>Strategic Studies</td>
<td>Advanced seminar in major topics in strategic studies, such as arms control, deterrence, and other military doctrines.</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 689</td>
<td>Unconventional Warfare</td>
<td>Analysis of warfare conducted by, or against, sub-state groups. This may include in-depth studies of guerrilla warfare, asymmetric conflict, or terrorism.</td>
</tr>
<tr>
<td>Political Science 691</td>
<td>Quantitative Analysis in Political Science</td>
<td>Examination of empirical research methods and techniques of quantitative analysis in the study of political phenomena. Computer use is required.</td>
</tr>
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<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 693</td>
<td>Advanced Quantitative Analysis in Political Science</td>
<td>Examination of empirical research methods and techniques of multivariate quantitative analysis in the study of political phenomena.</td>
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<td></td>
<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 699</td>
<td>Qualitative Analysis in Political Science</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
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</tr>
<tr>
<td>Political Science 715</td>
<td>Special Topics in Political Theory</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 721</td>
<td>Special Topics in Canadian Politics</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 723</td>
<td>Special Topics in Public Policy</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 725</td>
<td>Special Topics in Public Administration</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 741</td>
<td>Special Topics in Public Law</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 755</td>
<td>Special Topics in Public Policy</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 781</td>
<td>Special Topics in International Relations</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 791</td>
<td>Scope and Methods in Political Science</td>
<td>Advanced seminar covering various approaches, topics, methods and theories employed in the discipline of political science.</td>
</tr>
<tr>
<td></td>
<td><strong>MAY BE REPEATED FOR CREDIT</strong></td>
<td></td>
</tr>
<tr>
<td>Political Science 797</td>
<td>Special Topics in International Relations</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td></td>
<td><strong>H(3-0)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisite(s):** Political Science 691 or consent of the Department.
### Courses of Instruction

#### Psychology PSYC

Instructor offered by members of the Department of Psychology in the Arts.
Department Head - K.S. Dobson

### Graduate Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology 601</td>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Psychology 607</td>
<td>H(3-0)</td>
<td></td>
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<tr>
<td>Psychology 611</td>
<td>H(3-3)</td>
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<td>Psychology 613</td>
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<td></td>
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<tr>
<td>Psychology 615</td>
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<tr>
<td>Psychology 617</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td>Psychology 619</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td>Psychology 620</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Advanced Topics in Brain and Cognitive Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology 630</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Advanced Topics in Social and Theoretical Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology 639</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Advanced Industrial and Organizational Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology 641</td>
<td>H(3-0)</td>
<td></td>
</tr>
<tr>
<td>Advanced Topics in Health Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology 650</td>
<td>F(1S-0)</td>
<td></td>
</tr>
<tr>
<td>Research Seminar in Clinical Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology 660</td>
<td>F(0-14)</td>
<td></td>
</tr>
<tr>
<td>Summer Practicum in Clinical Psychology</td>
<td>Supervised training experience in an approved clinical setting. Provides exposure to basic issues and techniques in the practice of psychological assessment. \n<strong>Note:</strong> Open only to students enrolled in the Clinical Psychology program.</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Psychology 671</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td>Psychological Assessment of Adults</td>
<td>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. \n<strong>Note:</strong> Open only to students enrolled in the Clinical Psychology program.</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Psychology 673</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td>Psychological Assessment of Children</td>
<td>An overview of theoretical, professional and ethical issues in the 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. \n<strong>Note:</strong> Open only to students enrolled in the Clinical Psychology program.</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Psychology 681</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td>Adult Psychotherapy</td>
<td>Theory, research, and practice in adult psychotherapy and behaviour change. Supervised exposure to the practice of adult psychotherapy in a relevant clinical setting. \n<strong>Note:</strong> Open only to students enrolled in the Clinical Psychology program.</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Psychology 683</td>
<td>H(3-3)</td>
<td></td>
</tr>
<tr>
<td>Child Psychotherapy</td>
<td>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. \n<strong>Note:</strong> Open only to students enrolled in the Clinical Psychology program.</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Psychology 700</td>
<td>H(3S-0)</td>
<td></td>
</tr>
<tr>
<td>Integrative Seminar in Psychology</td>
<td>Selected interdisciplinary topics in Psychology. Topics will vary. \n<strong>Prerequisite(s):</strong> Consent of the Department \n<strong>May be repeated for credit</strong></td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Psychology 702</td>
<td>H(0-3)</td>
<td></td>
</tr>
<tr>
<td>Research in Brain and Cognitive Sciences</td>
<td>Completion of a research project in Brain and/or Cognitive Sciences conducted under the supervision of a faculty member. Topics may vary. \n<strong>Prerequisite(s):</strong> Consent of the Department</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Course Code</td>
<td>Title</td>
<td>Hours</td>
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<tr>
<td>---------------------</td>
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</tr>
<tr>
<td>Psychology 703</td>
<td>Research in Social and Theoretical Psychology</td>
<td>H(0-3)</td>
</tr>
<tr>
<td>Psychology 709</td>
<td>Research in Industrial/Organizational Psychology</td>
<td>H(0-3)</td>
</tr>
<tr>
<td>Psychology 710</td>
<td>Integrative Seminar in Psychology</td>
<td>F(3S-0)</td>
</tr>
<tr>
<td>Psychology 712</td>
<td>Research in Brain and Cognitive Sciences</td>
<td>F(0-3)</td>
</tr>
<tr>
<td>Psychology 713</td>
<td>Research in Social and Theoretical Psychology</td>
<td>F(0-3)</td>
</tr>
<tr>
<td>Psychology 720</td>
<td>Seminar in Brain and Cognitive Sciences</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Psychology 730</td>
<td>Seminar in Social and Theoretical Psychology</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Psychology 739</td>
<td>Seminar in Industrial/Organizational Psychology</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Psychology 750</td>
<td>Advanced Seminar in Clinical Psychology</td>
<td>Q(3S-0)</td>
</tr>
<tr>
<td>Psychology 751</td>
<td>Special Topics in Adult Psychopathology</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Psychology 760</td>
<td>Specialty Practicum in Clinical Psychology I</td>
<td>F(1-7)</td>
</tr>
<tr>
<td>Psychology 762</td>
<td>Specialty Practicum in Clinical Psychology II</td>
<td>F(1-7)</td>
</tr>
<tr>
<td>Psychology 765</td>
<td>Practicum in Clinical Psychology</td>
<td>H(1-7)</td>
</tr>
<tr>
<td>Psychology 798</td>
<td>Pre-Doctoral Internship in Clinical Psychology</td>
<td>TBD</td>
</tr>
<tr>
<td>Public Policy 601</td>
<td>Foundations I</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Public Policy 603</td>
<td>Foundations II</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Public Policy 605</td>
<td>Markets and Public Policy</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Public Policy 607</td>
<td>Politics and Collective Choice</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Public Policy 609</td>
<td>Decision Analysis</td>
<td>H(3-0)</td>
</tr>
<tr>
<td>Public Policy 611</td>
<td>Independent Study</td>
<td>H(3-0)</td>
</tr>
</tbody>
</table>
Courses of Instruction

Public Policy 613  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  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  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  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  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, on-line 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  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 with input provided by an expert from the private sector or public sector.

Pure Mathematics 501  H(3-0)
**Integration Theory**
Abstract measure theory, basic integration theorems, Fubini’s theorem, Radon-Nikodym theorem, further topics.
Prerequisite(s): Pure Mathematics 545 or consent of the Division.
Antirequisite(s): Credit for both Pure Mathematics 501 and 601 will not be allowed.

Pure Mathematics 503  H(3-0)
**Topics in Mathematics**
According to interests of students and instructor.
Prerequisite(s): Consent of the Division.
MAY BE REPEATED FOR CREDIT

Pure Mathematics 505  H(3-0)
**Topography**
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 consent of the Division.

Pure Mathematics 511  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, or consent of the Division.
Antirequisite(s): Credit for both Pure Mathematics 511 and 611 will not be allowed.
Note: Pure Mathematics 431 is recommended.

Pure Mathematics 521  H(3-0)
**Complex Analysis**
Prerequisite(s): Pure Mathematics 435 or 455 or consent of the Division.

Pure Mathematics 529  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 both Pure Mathematics 529 and 469 will not be allowed.

Pure Mathematics 545  H(3-0)
**Honours Real Analysis II**
Sequences and series of functions; theory of Fourier analysis, functions of several variables: Inverse and Implicit Functions and Rank Theorems, Integration of differential forms, Stokes’ Theorem, Measure and Lebesgue integration.
Prerequisite(s): Pure Mathematics 455; or a grade of “B+” or better in Pure Mathematics 435.

Graduate Courses
Note: Students are urged to make their decisions as early as possible as to which graduate courses they wish to take, since not all these courses will be offered in any given year.

Pure Mathematics 601  H(3-0)
**Integration Theory**
Abstract measure theory, basic integration theorems, Fubini’s theorem, Radon-Nikodym theorem, further topics.
Prerequisite(s): Pure Mathematics 545 or consent of the Division.
Antirequisite(s): Credit for both Pure Mathematics 601 and 501 will not be allowed.

Pure Mathematics 603  H(3-0)
**Conference Course in Pure Mathematics**
This course is offered under various subtitles. Consult Department for details.
MAY BE REPEATED FOR CREDIT

Pure Mathematics 607  H(3-0)
**Topology II**
Fundamental groups: covering spaces, free products, the van Kampen theorem and applications; homology.
Prerequisite(s): Pure Mathematics 505 or consent of the Division.

Pure Mathematics 611  H(3-0)
**Algebra IV**
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 or consent of the Division. Pure Mathematics 431 is recommended.
Antirequisite(s): Credit for both Pure Mathematics 511 and 611 will not be allowed.

Pure Mathematics 621  Q(2S-0)
**Research Seminar**
Reports on studies of the literature or of current research.
Note: All graduate students in Mathematics and Statistics are required to participate in one of Applied Mathematics 621, Pure Mathematics 621, Statistics 621 each semester.
MAY BE REPEATED FOR CREDIT
NOT INCLUDED IN GPA
Courses of Instruction

Pure Mathematics 627 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, or consent of the Division.

Antirequisite(s): Pure Mathematics 471.

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 efficient implementation of point addition. Applications to cryptography will be discussed, including elliptic-curve-based Diffie-Hellman key exchange, El Gamal encryption, and digital signatures, as well as the associated computational problems on which their security is based.

Prerequisite(s): Pure Mathematics 315 or consent of the Division.

Advanced Cryptography and Cryptanalysis
Cryptography based on quadratic residuosity. 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 or consent of Division.

Antirequisite(s): Credit for both Pure Mathematics 629 and 649 will not be allowed.

Religious Studies RELS

Graduate Courses

Religious Studies 601 H(3-0)

Studies in Western Religions MAY BE REPEATED FOR CREDIT

Religious Studies 603 H(3-0)

Studies in Eastern Religions MAY BE REPEATED FOR CREDIT

Religious Studies 605 H(3-0)

Studies in the Nature of Religion MAY BE REPEATED FOR CREDIT

Religious Studies 607 H(0-3T)

Supervised Master's Thesis Inquiry

Religious Studies 609 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 H(3-0)

Specialized Studies in Western Religions MAY BE REPEATED FOR CREDIT

Religious Studies 683 H(3-0)

Specialized Studies in Eastern Religions MAY BE REPEATED FOR CREDIT

Religious Studies 685 H(3-0)

Specialized Studies in the Nature of Religion MAY BE REPEATED FOR CREDIT

Religious Studies 701 H(3-0)

Studies in Western Religions MAY BE REPEATED FOR CREDIT

Religious Studies 703 H(3-0)

Studies in Eastern Religions MAY BE REPEATED FOR CREDIT

Religious Studies 705 H(3-0)

Studies in the Nature of Religion MAY BE REPEATED FOR CREDIT

Religious Studies 707 H(3-0)

PhD Departmental Colloquium
MAY BE REPEATED FOR CREDIT NOT INCLUDED IN GPA

Religious Studies 709 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

Graduate Courses

Risk Management and Insurance 763 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.

Social Work SOWK

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 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 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 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 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 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Work 633</td>
<td>Foundational Field Practicum</td>
<td>H(426 hours-2T)</td>
</tr>
<tr>
<td>Social Work 637</td>
<td>Human Behaviour in the Environment</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 641</td>
<td>Models of Practice</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 645</td>
<td>Issues in Social Work Research</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 651</td>
<td>Policy as Context for Clinical Work</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 653</td>
<td>Comparative Approaches to Change</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 655</td>
<td>Thesis Research</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 657</td>
<td>Clinical Social Work Applications</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 659</td>
<td>Evidence and Clinical Practice</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 663</td>
<td>Influencing Policy Development</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 667</td>
<td>Leadership Theories in Action</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 669</td>
<td>Leading Organizations and Communities</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 671</td>
<td>Social Policy</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 673</td>
<td>International Social Development</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 675</td>
<td>Advanced International Social Work Modules</td>
<td>H(3S-0)</td>
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<tr>
<td>Social Work 677</td>
<td>Social Work Research for International and Community Methods</td>
<td>H(3S-0)</td>
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<tr>
<td>Social Work 679</td>
<td>Special Topics Seminar I</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 682</td>
<td>Special Seminar II</td>
<td>E(3S-0)</td>
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<tr>
<td>Social Work 693</td>
<td>Research as a Foundation for Leadership</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 695</td>
<td>Becoming an Evidence-Based Leader</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 696</td>
<td>Social Work 696</td>
<td>F(525 hours within two consecutive terms)</td>
</tr>
<tr>
<td>Social Work 697</td>
<td>Diversity, Oppression and Social Justice</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 699</td>
<td>Special Topics Seminar II</td>
<td>H(3S-0)</td>
</tr>
<tr>
<td>Social Work 721</td>
<td>Integrative Research Colloquia</td>
<td>H(2S-0)</td>
</tr>
<tr>
<td>Course Code</td>
<td>Title</td>
<td>H(2S-0)</td>
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</tr>
<tr>
<td>Sociology 603</td>
<td>Seminar in Sociology of Health and Illness</td>
<td></td>
</tr>
<tr>
<td>Sociology 611</td>
<td>Social Statistics: The General Linear Model</td>
<td></td>
</tr>
<tr>
<td>Sociology 667</td>
<td>Seminar on Ethnic Relations</td>
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</tr>
<tr>
<td>Sociology 671</td>
<td>Seminar on the Sociology of Families</td>
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</tr>
<tr>
<td>Sociology 689</td>
<td>Special Topics in Sociology</td>
<td></td>
</tr>
<tr>
<td>Sociology 701</td>
<td>Doctoral Seminar in Sociology</td>
<td></td>
</tr>
<tr>
<td>Sociology 702</td>
<td>Doctoral Seminar in Professional Sociology</td>
<td></td>
</tr>
<tr>
<td>Sociology 705</td>
<td>Selected Topics in Advanced Qualitative Methods</td>
<td></td>
</tr>
<tr>
<td>Sociology 711</td>
<td>Selected Topics in Advanced Quantitative Methods</td>
<td></td>
</tr>
<tr>
<td>Sociology 715</td>
<td>Selected Topics in Advanced Methodological Issues</td>
<td></td>
</tr>
<tr>
<td>Sociology 731</td>
<td>Doctoral Seminar in Sociological Theory</td>
<td></td>
</tr>
</tbody>
</table>

**Courses of Instruction**

**Social Work 741**

**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 only or consent of the Faculty.

**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 is emphasized.

**Note:** Restricted to Social Work PhD students only or consent of the Faculty.

**Research Methods I: Quantitative**

Quantitative methodological and design options in social work research.

**Note:** Restricted to Social Work PhD students only or consent of the Faculty.

**Research Methods II: Qualitative**

Qualitative methodological and design options in social work research.

**Note:** Restricted to Social Work PhD students only or consent of the Faculty.

**Quantitative Data Analysis**

Statistical analysis of quantitative data.

**Note:** Restricted to Social Work PhD students only or consent of the Faculty.

**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.

**Department Head – G. Ranson**

**Graduate Courses**

Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599.

**Sociology 601**

**Conference Course 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**

**Master’s Seminar in Professional Sociology**

NOT INCLUDED IN GPA

**Sociology 613**

**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 or consent of the Department.

**Sociology 615**

**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 or consent of the Department. Sociology 413 is recommended.

**Sociology 625**

**Seminar on Deviant Behaviour**

**Prerequisite(s):** Sociology 325 or consent of the Department.

**Sociology 631**

**Seminar in Sociological Theory**

**Prerequisite(s):** Sociology 331 and 333 or equivalents; or consent of the Department.

**Sociology 653**

**Seminar on Urban Sociology**

**Prerequisite(s):** Sociology 353 or consent of the Department.

**Sociology 665**

**Seminar on Social Stratification and Inequality**

**Prerequisite(s):** Consent of the Department.

**Sociology 667**

**Seminar on Ethnic Relations**

**Prerequisite(s):** Sociology 375 or consent of the Department.

**Sociology 671**

**Seminar on the Sociology of Families**

**Prerequisite(s):** Sociology 471 or consent of the Department.

**Sociology 677**

**Seminar in Sociology of Gender Relations**

**Prerequisite(s):** Consent of the Department.

**Sociology 695**

**Seminar in Work**

**Prerequisite(s):** Consent of the Department.
### Courses of Instruction

**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.

Computer Science Department Head - C. Williamson (Acting)

Electrical and Computer Engineering Department Head - W. Rosehart

Registration in each course requires the consent of the Department teaching the course.

**Graduate Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Engineering 605</td>
<td>Q(3-1)</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Special Topics in Software Engineering</td>
<td>A study of practical approaches of industrial relevance to students specializing in Software Engineering.</td>
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</tr>
<tr>
<td>Note:</td>
<td>Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 607</td>
<td>H(3-1)</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Special Topics in Software Engineering</td>
<td>A study of problems of particular interest to students specializing in Software Engineering.</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>Consult Department (Computer Science or Electrical and Computer Engineering) for details regarding offerings in the upcoming academic year.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 611</td>
<td>Q(3-1)</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Requirements Engineering I</td>
<td>The elicitation, modelling, expression, and validation of requirements.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 613</td>
<td>Q(3-1)</td>
<td>Requirements Engineering II</td>
</tr>
<tr>
<td>Applications of requirements engineering to the management of the lifecycle of software development from requirements elicitation through analysis, design, coding, testing, enhancement and reuse.</td>
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<td></td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Software Engineering 611</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 615</td>
<td>H(3-1)</td>
<td>Agile Software Engineering</td>
</tr>
<tr>
<td>Investigation and application of agile software development practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 615 and Computer Science 601.93 will not be allowed.</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>Students are expected to have some background in software development as preparation for this course. Lectures may run concurrently with Software Engineering 515.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 627</td>
<td>H(3-1)</td>
<td>Software Engineering Decision Support</td>
</tr>
<tr>
<td>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.</td>
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<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 627 and 625 will not be allowed.</td>
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</tr>
<tr>
<td>Software Engineering 629</td>
<td>Q(3-0)</td>
<td>Software Engineering Standards and Models</td>
</tr>
<tr>
<td>(formerly Software Engineering 609.17)</td>
<td></td>
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<tr>
<td>Formal description of algorithms for current software engineering standards and models. Trends and future development in software engineering standardization.</td>
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<tr>
<td>Software Engineering 637</td>
<td>H(3-2)</td>
<td>Dependability and Reliability of Software Systems</td>
</tr>
<tr>
<td>Principles of software dependability techniques, and techniques to improve and predict software reliability.</td>
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</tr>
<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 637 and 521 will not be allowed.</td>
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</tr>
<tr>
<td>Note:</td>
<td>Engineering 319, Software Engineering 511, and Software Engineering 437 or 421, or their equivalents, are recommended as preparation for this course.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 639</td>
<td>H(3-0)</td>
<td>Advanced Software Testing</td>
</tr>
<tr>
<td>(formerly Software Engineering 607.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
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<tr>
<td>Note:</td>
<td>Software Engineering 437 or equivalent is recommended as preparation for this course.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 641</td>
<td>H(3-0)</td>
<td>Software Evolution and Reuse</td>
</tr>
<tr>
<td>(formerly Computer Science 601.33)</td>
<td></td>
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<tr>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 641 and 541 will not be allowed.</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>Software Engineering 301 or Computer Science 301 or equivalents are recommended as preparation for this course. Lectures may run concurrently with Software Engineering 541.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 651</td>
<td>H(3S-0)</td>
<td>Half-Course Project</td>
</tr>
<tr>
<td>A project in either software development or software best practice and experience.</td>
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<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 651 and 652 will not be allowed.</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>This course is only available to students registered in the course-based MSc in Computer Science with the Software Engineering Specialization. Students should register for this course in the semester when they will complete it.</td>
<td></td>
</tr>
<tr>
<td>Software Engineering 652</td>
<td>F(3S-0)</td>
<td>Full-Course Project</td>
</tr>
<tr>
<td>A project in either software development or software best practice and experience.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 652 and either 651 or Electrical Engineering 698 will not be allowed.</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>This course is only available to students registered in the course-based MSc in Computer Science with the Software Engineering Specialization or to MEng students with a specialization in Software Engineering. Students should register for this course in the semester when they will complete it.</td>
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</tr>
<tr>
<td>Software Engineering 697</td>
<td>Q(3-0)</td>
<td>Agent-Based Software Engineering</td>
</tr>
<tr>
<td>(formerly Software Engineering 609.22)</td>
<td></td>
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</tr>
<tr>
<td>Principles and practices of engineering agent-based software systems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antirequisite(s):</td>
<td>Credit for both Software Engineering 697 and Computer Science 609 will not be allowed for programs offered by the Department of Computer Science.</td>
<td></td>
</tr>
</tbody>
</table>

**Software Engineering for Engineers ENSF**

Instruction offered by members of the Department of Electrical and Computer Engineering in the Schulich School of Engineering.

Department Head - W. Rosehart

Associate Heads – Mike Potter (Undergraduate), D. Westwick (Graduate)

**Graduate Courses**

Registration in all courses requires the approval of the Department of Electrical and Computer Engineering.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Engineering for Engineers 602</td>
<td>H(3-1)</td>
<td>MAY BE REPEATED FOR CREDIT</td>
</tr>
<tr>
<td>Software Engineering for Engineers 602</td>
<td>(formerly Software Engineering for Engineers 619.71)</td>
<td></td>
</tr>
<tr>
<td>Virtual Environments and Applications</td>
<td>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.</td>
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</tr>
<tr>
<td>Prerequisite(s):</td>
<td>Objected-Oriented Programming (C++ or equivalent).</td>
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</tr>
<tr>
<td>Software Engineering for Engineers 619</td>
<td>H(3-1)</td>
<td>Special Topics Half Course</td>
</tr>
<tr>
<td>A study of problems of particular interest to students specializing in Software Engineering.</td>
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<td></td>
</tr>
<tr>
<td>Note:</td>
<td>Consult Department of Electrical and Computer Engineering for details regarding offerings in the upcoming academic year.</td>
<td></td>
</tr>
</tbody>
</table>

MAY BE REPEATED FOR CREDIT
## Courses of Instruction

### Space Physics SPPH

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Department Head - R.I. Thompson

Note: For listings of related courses, see Astronomy, Astrophysics, Medical Physics and Physics.

### Graduate Course

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish 565</td>
<td>Medieval and Golden Age Literature</td>
</tr>
<tr>
<td>Spanish 571</td>
<td>Art and Literature</td>
</tr>
<tr>
<td>Spanish 573</td>
<td>Critical Analysis of Hispanic Cinemas</td>
</tr>
</tbody>
</table>

### Spanish SPAN

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Arts.

Department Head – E. Montes Garcés

### Undergraduate Courses

Only in exceptional circumstances and where appropriate to a student’s M.A. program may graduate credit be received for courses numbered 500-599.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish 533</td>
<td>Uses of Spanish as a Second Language</td>
</tr>
<tr>
<td>Spanish 553</td>
<td>Spanish American Literature to 1900</td>
</tr>
<tr>
<td>Spanish 555</td>
<td>Spanish American Literature after 1900</td>
</tr>
<tr>
<td>Spanish 557</td>
<td>Current Trends in Hispanic Studies</td>
</tr>
</tbody>
</table>

### Spanish 565

Medieval and Golden Age Literature
Representative works of literature in the Spanish language from the 10th to the 17th centuries. Format and content of course may vary from year to year.

Prerequisite(s): Spanish 405, 407, 421 and 423, or consent of the Department.

### Spanish 571

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, 407, 421 and 423, or consent of the Department.

### Spanish 573

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 latinoamericano, New cinemas, etc.). Use of contemporary theories and study of cinematographic techniques.

Prerequisite(s): Spanish 405, 407, 421, and 423 or consent of the Department.

### Spanish 581

Spanish Literature and Culture from the 18th Century to the Spanish Civil War
(formerly Spanish 481)
Survey of major works and cultural movements from the 18th century to the early 20th century. Focus on reading and analytical skills. Format and content of the course may vary from year to year.

Prerequisite(s): Spanish 405, 407, 421 and 423, or consent of the Department.

### Spanish 583

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, 407, 421 and 423, or consent of the Department.

### Spanish 593

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, 407, 421 and 423, or consent of the Department.

Note: This course is mandatory for students registered in the Spanish Honours Program. MAY BE REPEATED FOR CREDIT

### Spanish 599

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, 407, 421 and 423, or consent of the Department.

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish 601</td>
<td>Literary and Cultural Theory</td>
</tr>
<tr>
<td>Spanish 613</td>
<td>Critical Analysis of Medieval Texts</td>
</tr>
<tr>
<td>Spanish 615</td>
<td>Golden Age Literature</td>
</tr>
<tr>
<td>Spanish 617</td>
<td>Theatre and Performance in the 19th or 20th Centuries</td>
</tr>
<tr>
<td>Spanish 619</td>
<td>Post-Franco Literature, Art and Film</td>
</tr>
<tr>
<td>Spanish 621</td>
<td>Art, Film and Literature in the Spanish Avant-Garde</td>
</tr>
<tr>
<td>Spanish 623</td>
<td>Spanish American Literature and Culture to 1900</td>
</tr>
<tr>
<td>Spanish 625</td>
<td>20th Century Spanish American Literature</td>
</tr>
<tr>
<td>Spanish 627</td>
<td>Avant-Garde Movements in Spanish America</td>
</tr>
<tr>
<td>Spanish 631</td>
<td>Popular Culture</td>
</tr>
<tr>
<td>Spanish 633</td>
<td>Writings in Exile</td>
</tr>
<tr>
<td>Spanish 635</td>
<td>Literature and the Visual Arts in Hispanic Culture</td>
</tr>
<tr>
<td>Spanish 637</td>
<td>Identities and Post-Colonial Voices</td>
</tr>
<tr>
<td>Spanish 639</td>
<td>Hispanic Female Voices</td>
</tr>
</tbody>
</table>

MAY BE REPEATED FOR CREDIT
Courses of Instruction

Spanish 641  H(3-0)
Hispanic Cinema  MAY BE REPEATED FOR CREDIT

Spanish 643  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.
Department Head - T. Bisztriczky

Undergraduate Courses

Only where appropriate to a student's program will graduate credit be received for courses numbered 500-599.

Statistics 505  H(3-1T)
Time Series Analysis
Trend fitting, auto-regressive schemes, moving average models, periodograms, second-order stationary processes, ARCH models, statistical software for time series. Additional topics may include Bayesian analysis, spectral theory, Kalman filtering.
Prerequisite(s): Statistics 429 or consent of the Division.

Statistics 517  H(3-1)
Practice of Statistics
Prerequisite(s): Statistics 429 or consent of the Division.
Antirequisite(s): Not open to students with Statistics 513 or 515.
Note: Prior or concurrent completion of Statistics 429 is strongly recommended.

Statistics 519  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 consent of the Division.

Note: Statistics 421 is highly recommended as preparation.

Statistics 523  H(3-0)
Nonparametric Statistics
Prerequisite(s): Statistics 323 or Mathematics 323 and 353 or consent of the Division.
Note: May not be offered every year. Consult the department for listings.

Statistics 525  H(3-0)
Multivariate Analysis
Prerequisite(s): Statistics 421 or consent of the Division.
Note: May not be offered every year. Consult the department for listings.

Statistics 529  H(3-1)
Special Topics in Applied Statistics
Content of the course will vary from year to year. Consult the Statistics Division for information on choice of topics.
Prerequisite(s): Consent of the Division.
MAY BE REPEATED FOR CREDIT

Statistics 531  H(3-1)
Monte Carlo Methods and Statistical Computing
Prerequisite(s): Statistics 323 or Mathematics 323 and 353 or consent of the Division.
Note: Statistics 421 is highly recommended as preparation.

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 601  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 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  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; nonparametric tests; factor analysis; discriminant analysis; Cox’s Proportional Hazard Model.

Statistics 619  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 621  H(3-0)
Multivariate Analysis

Statistics 625  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  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  H(3-0)
Nonlinear Regression
Topics include but are not restricted to selections from: linear approximations; model specification; various iterative techniques; assessing fit; multire- sponse parameter estimation; models defined by systems of DEs; graphical summaries of inference regions; curvature measures.

Statistics 639  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  H(3-0)
Theory of Probability I

Statistics 703  H(3-0)
Theory of Probability II

Statistics 721  H(3-0)
Theory of Estimation

Statistics 723  H(3-0)
Theory of Hypothesis Testing

Statistics 761  H(3-0)
Stochastic Processes I

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 at the advanced doctoral level. These courses are numbered in the series 800.01 to 899.99. Such offerings are, of course, conditional upon the availability of staff resources.
Courses of Instruction

Strategic Studies STST

Instruction offered by members of the Faculty of Arts.
Graduate Coordinator – P. Brennan

Graduate Courses

Only where appropriate to a student’s program may graduate credit be received for courses numbered 500-599.

Strategic Studies 601 (4.5 units, 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 (4.5 units, 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 609 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 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 H(3-0)

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.

Strategic Studies 651 H(3-0)

Reading Seminar
Prerequisite(s): Permission of the Graduate Coordinator.
MAY BE REPEATED FOR CREDIT

Strategic Studies 653 H(3-0)

Research Seminar
Prerequisite(s): Permission of the Graduate Coordinator.
MAY BE REPEATED FOR CREDIT

Strategic Studies 655 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 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 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 661 H(3S-0)

Circumpolar Security
Assessment of the security environment of the circumpolar regions. This seminar will assess both the differing theoretical conceptualizations of security in the Arctic and the policies of the circumpolar states as they pursue Arctic security.

Strategic Studies 751 H(3-0)

Reading 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. Strategy and Global Management Chairperson – A. Verbeke

Graduate Courses

Strategy and Global Management 601 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 both Strategy and Global Management 601 and 701 will not be allowed.

Strategy and Global Management 725 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): Management Information Systems 725.

Strategy and Global Management 751 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 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 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 H(3-0)

Strategic Management II
Prerequisite(s): Strategy and Global Management 601 or consent of the Haskayne School of Business.

Strategy and Global Management 797 H(3S-0)

Advanced Seminar in Strategy and Global Management
Prerequisite(s): Consent of the Haskayne School of Business.
MAY BE REPEATED FOR CREDIT

Strategy and Global Management 799 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 SDEV

Instruction offered by members of the Faculties of Environmental Design, Law, Schulich School of Engineering and the Haskayne School of Business.

Note: The following courses are taught at the Universidad San Francisco de Quito (USFQ) campus in Quito, Ecuador and at the University of Calgary. Enrolment is limited to students admitted to the MSc in Sustainable Energy Development program, or approved by the Director, Centre for International Management, Haskayne School of Business.

Graduate Courses

Sustainable Energy Development 601 H(3-0) (formerly Energy and the Environment 601)

Energy Systems I: Non-Renewable Energy
Explore the interaction between non-renewable resources (petroleum, natural gas, coal, thermal stations, hydro) and the environment. Consider the technical and environmental aspects within the energy and environment cycle for evaluation and management.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 603 H(3-0) (formerly Energy and the Environment 603)

Energy Systems II: Renewable Energy
Study renewable energy sources as prospective energy suppliers for the future, along with conditions for sustained implementation of renewable energy technologies (biomass, solar, wind, geothermal, co-generation).

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 605 H(3-0) (formerly Energy and the Environment 605)

Ecology, Sustainable Development and Indigenous Cultures
Examines the inter-relationships between ecological systems, indigenous cultures and sustainable global development. Provides a case based analysis of selected issues and strategic management mechanisms for dealing with these issues in the energy project development and approval process.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 607 H(3-0) (formerly Energy and the Environment 607)

Water Pollution and its Impact on the Energy Sector
Causes and consequences of water pollution and management practices and technologies for prevention, mitigation and control of pollutant effluents, 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 H(3-0) (formerly Energy and the Environment 609)

Air Pollution and its Impact on the Energy Sector
Causes and consequences of air pollution and management practices and technologies for prevention, mitigation and control of pollutant emissions.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 611 H(3-0) (formerly Energy and the Environment 611)

Land Pollution and Waste Management in the Energy Sector
Causes and consequences of land pollution and management practices and technologies for prevention, mitigation and control of pollution. Waste management principles and effective practices in the development of energy projects.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 613 H(3-0) (formerly Energy and the Environment 613)

Energy Systems III: Planning and Energy Economics
Financial principles and evaluation techniques and their application to energy investment planning and to assessment of foundations in energy economics and policies.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 615 H(3-0) (formerly Energy and the Environment 615)

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 H(3-0) (formerly Energy and the Environment 617)

Human Resource and Management in the Energy Sector
The 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. An application, skill development, managerial issues, and workplace trends focus.

Prerequisite(s): Admission to the Sustainable Energy Development Program only or consent of the Program Director.

Sustainable Energy Development 619 H(3-0) (formerly Energy and the Environment 619)

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; non-judicial dispute resolution.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 621 H(3-0) (formerly Energy and the Environment 621)

Environmental Management Tools in the Energy Sector
Environmental management tools including strategic policies; structures; impact and production assessment; audits; indicators and reporting; life cycle assessment; risk management; and economic instruments.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 623 H(3-0) (formerly Energy and the Environment 623)

Strategic Environmental Planning for Energy Organizations
A strategic approach to managing environmental and social issues facing energy organizations and its economic rationale in a competitive global market place.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 625 H(3-0) (formerly Energy and the Environment 625)

Research Project
An introduction to research methodology and to energy environmental issues. Knowledge and skill are demonstrated through the completion of an interdisciplinary project.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 627 H(3-0) (formerly Energy and the Environment 627)

Group Research Project
Completion and presentation of a group project that is related to a current environmental issue or problem.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

Sustainable Energy Development 629 H(3-0) (formerly Energy and the Environment 629)

Advanced Seminars
Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

MAY BE REPEATED FOR CREDIT
NOT INCLUDED IN GPA

Sustainable Energy Development 699 H(3-0) (formerly Energy and the Environment 699)

Topics in Energy and the Environment
Intensive study of selected topics in energy and the environment and related subjects. Course will reflect changing content needs and faculty interests.

Prerequisite(s): Admission to the Sustainable Energy Development Program or consent of the Program Director.

MAY BE REPEATED FOR CREDIT
Courses of Instruction

Tourism Management TOUR

Instruction offered by members of the Haskayne School of Business.

Tourism Management Chairperson: L. Ricker

Graduate Courses

Tourism Management 741 H(3-0)

(Please note: This course is offered by the University and individual programs at the University of Calgary.)

Policy Planning and Development in Tourism


Prerequisite(s): Consent of the Haskayne School of Business.

Tourism Management 745 H(3-0)

(Please note: This course is offered by the University and individual programs at the University of Calgary.)

International Tourism


Prerequisite(s): Consent of the Haskayne School of Business.

PhD Course

Tourism Management 799 H(3S-0)

(Please note: This course is offered by the University and individual programs at the University of Calgary.)

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

University UNIV

Instruction offered by the University and individual Faculties depending on the topic(s) being covered.

Graduate Courses

University 601 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 Coordinator.

University 611 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 H(0-8)

Introduction to Interdisciplinary Design Practice

University 615 H(0-8)

Advanced Interdisciplinary Design Practice

Prerequisite(s): University UNIV 611.01.

Veterinary Medicine VETM

Instruction and services offered by the Faculty of Veterinary Medicine

Note: The Doctor of Veterinary Medicine program at the University of Calgary is presently in the development stage and therefore the University reserves the right to make whatever changes are necessary to the content of hours of instruction of individual Veterinary Medicine courses in the program.

Associate Dean (Curriculum): J. Bailey

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 600 F(0-1S-0)

Seminars in Veterinary Medical Sciences

Instruction in effective oral presentation and provide feedback on annual seminars to the Faculty.

NOT INCLUDED IN GPA

Veterinary Medicine 601 H(3-0)

Professional Skills in Health Science Research

Series of workshops focusing on skills essential for success in health science research. Topics include: Research Integrity; 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 H(3-0)

(Biology 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.

Veterinary Medicine 605 H(3-0)

Introduction to Research Methods

Introductory course on how to design, analyze, and fund health science research. Various study types will be explored including observational studies, medical tests, clinical and experimental trials.

Prerequisite(s): Consent of the Faculty.

Veterinary Medicine 690 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.

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 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 coordinator and student’s supervisor, if applicable.

Veterinary Medicine 702 H(3-0)

Advanced Topics in Stem Cell Biology and Regenerative Medicine

The course will provide 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 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 consult the instructor for information.
Interdisciplinary Specializations

Biological Anthropology
BANT [UPDATED]

Contact Information
Location: Earth Sciences 852
Faculty number: 403.220.2665
Fax: 403.282.9562
E-mail address: wwilson@ucalgary.ca
Web page URL: https://bioanth.ucalgary.ca/

1. Degrees and Specializations Offered
The University offers an interdisciplinary specialization in Biological Anthropology to students registered in an existing graduate program. The student will receive the degree offered by the home program:
- Doctor of Philosophy (PhD)
- Master of Science (MSc), thesis-based
- Master of Arts (MA), thesis-based

Specialization: Biological Anthropology (Interdisciplinary)

2. Admission Requirements
In addition to Faculty of Graduate Studies requirements, all applicants must meet the minimum standards of the home program. Admission to the specialization requires:
- a) A Bachelor of Arts or Bachelor of Science degree (and Master of Arts degree for admission to the PhD program) in Anthropology, Archaeology, Biology, Zoology, Ecology, or Health Sciences with a GPA of at least 3.30 on a 4-point scale in the last two years of program or over the last ten full-course equivalents.
- b) An example of the applicant’s written work: a term paper, research paper, Master of Arts, or honours thesis that the applicant considers representative of his or her best work. Published work authored by the applicant is also acceptable provided the applicant is the sole or senior author.
- c) A concise statement setting forth the applicant’s academic interests and reasons for wishing to pursue graduate work in the specialization. The area of thesis research should also be specified.
- d) An up-to-date curriculum vitae.

3. Application Deadline
The deadlines for the submission of complete application is January 15 for September admission and funding.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies and the home program requirements, the specialization requires:
- Master of Arts/Master of Science
  1. Five half-course equivalents, which shall include:
     a) Archaeology 617 (Theory and its Application in Biological Anthropology).
     b) Anthropology 603 (Thesis Development).
     c) Any two of the following: Medical Science 755 (Human Gross Anatomy), Archaeology 613 (Analysis of Human Skeletal Remains), Anthropology 635 (Primatological Theory), or Anthropology 605 (Professional Skills for Anthropologists), Anthropology 613 (Current Issues in Methodology in Primatology).
     d) One optional course relevant to the proposed research topic.
     e) All students are expected to have proficiency in statistics. The supervisor and two other faculty members of the specialization, in concert with the applicant, will determine if additional course work is needed in statistics, depending upon the applicant’s background and proposed research area.
  2. A season of fieldwork offering appropriate experience for the proposed research topic (for example, primate field study, archaeological excavation, or field research in human biology), to be approved by the supervisor. However, students specializing in laboratory-based topics (for example, morphological studies or bone chemistry) may substitute an approved specialization of laboratory work for the fieldwork requirement.

Doctor of Philosophy

1. Course Requirements:
- If students entering the PhD specialization have completed the Master’s specialization in Biological Anthropology, or if they have completed equivalent courses in another Master’s program, they will not be required to repeat those courses. Rather, additional courses will be determined at the discretion of the student’s supervisory committee.
- Normally, six half-course equivalents which shall include (unless completed previously):
   a) Archaeology 617 (Theory and its Application in Biological Anthropology)
   b) Anthropology 701 (Independent Studies)
   c) Any two of the following: Medical Science 755 (Human Gross Anatomy), Archaeology 613 (Analysis of Human Skeletal Remains), Anthropology 635 (Primatological Theory) or Anthropology 605 (Professional Skills for Anthropologists), Anthropology 613 (Current Issues in Methodology in Primatology)
   d) Two courses relevant to the proposed research topic.

The number of courses required of each student may vary according to his or her particular needs as determined by the Supervisory Committee. Statistics will be required in the event the student’s committee deems it necessary. The courses will be selected based on the student’s previous statistics training and the type of data analyses to be conducted in the research.

2. Two seasons of fieldwork offering appropriate experience for the proposed research topic (for example, primate field study, archaeological excavation, or field research in human biology), to be approved by the supervisor. Fieldwork may have been undertaken before entry into the specialization and may be counted toward the fieldwork requirement. Students specializing in laboratory-based topics (for example, morphological studies or bone chemistry) may substitute an approved specialization of laboratory work for the fieldwork requirement.

3. Submission to the supervisory committee of a paper that demonstrates an ability to research and write a paper at a professional level.

4. Proficiency in a second language.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
Students may apply for no more than one 500-level course for graduate credit, subject to the approval of the Program Director. Graduate students taking a 500-level course for graduate credit will be required to complete additional assignments.

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8. Time Limit
Expected completion time for the MA and MSc is two years and maximum completion time is four years. Expected completion time for the PhD is four years and maximum completion time is six years.

9. Supervisory Assignments
Students will be assigned a supervisor upon admission.

10. Required Examinations
Final thesis oral examinations are open. Oral Candidacy Examinations Following the completion of all course work, the research paper and the language requirement, doctoral students sit the Candidacy Examination. In the Biological Anthropology Graduate Specialization, the Candidacy Examination consists of two parts in sequence, as follows: (1) a written component and (2) an oral component. The oral candidacy examination is required by University regulations and must be held no later than twenty-eight months following initial registration as a full-time graduate student in a Ph.D. program. Students entering the doctoral program with a Bachelor’s degree, or transferring into a doctoral program from a Master’s program before the Master’s program is completed, must attempt the candidacy examinations no later than thirty-six months after initial registration in the Faculty of Graduate Studies. The Candidacy Examination in the Biological Anthropology Graduate Specialization consists of a written plus an oral examination administered by the Candidacy Examination Committee, composed of the Supervisory Committee plus two additional members, one of whom must be external to the Specialization if the External is not already a member of the Supervisory Committee. The Candidacy Examination is an examination of the student’s knowledge and abilities to reason, utilize the relevant literature, and to solve problems within the three fields or areas which have been set out. In consultation with the student, the Supervisory Committee will determine three areas of knowledge for which the student will be responsible in his or her Candidacy Examination. These topics will be communicated (in writing) to the student, with copies to other members of the Supervisory Committee. These topics will also be communicated to the two other members of the Candidacy Examination Committee, who must be selected no later than six weeks prior to the oral examination. Members of the Candidacy Examination Committee will each submit one or two questions, so that there are at least two questions within each of the three areas. The supervisor will select six questions from those submitted, and provide them to the student at least five weeks prior to the Oral Candidacy Examination. The student will select one question from each of the three areas for a total of three questions. The student will have two weeks in which to prepare answers to these questions as a take-home, open-book exam. Each answer should be approximately 6000 words. Copies of the completed examination will be distributed to all members of the Examination Committee. The Committee will assess the written exam on a Pass/Fail basis. The oral examination is conducted in accordance with Faculty of Graduate Studies regulations. In the oral component of the Candidacy Examination, the written examinations will serve as the basis from which the examination shall proceed, but examiners are not limited to the written component in framing the questions asked, and questioning may range into cognate areas, at the discretion of the Neutral Chair. Students must pass both the written and oral exams in order to pass the candidacy exam.

11. Research Proposal Requirements
Within twenty months of entering the program, the student, with the supervisor’s advice, develops a thesis research proposal. This is then transmitted to the student’s supervisory committee for agreement and to the Program Director for approval and placed on file.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar. Students applying for scholarships must submit their applications to the home program by January 2.

14. Other Information
Given the limited resources, the specialization may, in any year, admit fewer applicants than those who are qualified to undertake graduate studies.

15. Faculty Members/Research Interests
See the website of the home department of the faculty member.

Clinical Research CRES
Applications for this interdisciplinary specialization are not currently being accepted.

Computational Media Design CMD
Contact Information
Location: Information and Communications Technology Building, Room 602
Faculty number: 403.220.6015
Fax: 403.284.4707
E-mail address: gradapps@cmd.ucalgary.ca
Web page URL: http://www.cmd.ucalgary.ca

1. Degrees and Specializations Offered
The University offers an interdisciplinary specialization in Computational Media Design to students registered in an existing graduate program in the Department of Computer Science, the Faculty of Environmental Design and the Departments of Art, Drama or Music. The student will receive the degree offered by the home program.

Master of Arts (MA), thesis-based
Master of Environmental Design (MEdes), thesis-based
Master of Fine Arts (MFA), thesis-based
Master of Music (MMUS), thesis-based
Master of Science (MSC), thesis-based
Doctor of Philosophy (PhD) Specialization: Computational Media Design (Interdisciplinary)

These degrees are offered jointly through the Department of Computer Science, Faculty of Science; Faculty of Environmental Design; and Departments of Art, Drama, and Music; Faculty of Arts.

Students may register in the above degree programs as part-time students where part-time enrolment is offered and only with permission from the Director of the CMD interdisciplinary specialization.

2. Admission Requirements
In addition to the Faculty of Graduate Studies and the home program requirements, the Specialization requires:

a) Admission to a Master’s or PhD home program that offers the CMD specialization (See list of degrees offered in article 1 above);

b) Single page statement of interest. This is not a proposal but a declaration of interest in the interdisciplinary research in arts, design and computer science;

c) Portfolios can be provided but are not required. A portfolio of up to 10 recent works presented in CD/DVD format, or made accessible on-line, is optional but strongly recommended. This is particularly true for students applying with an arts or design background;

d) Two reference letters.

Master’s Degree
a) An undergraduate background that includes a four-year Bachelor’s degree or equivalent. While applicants from any discipline will be considered, undergraduate degrees in Computer Science, Fine Arts, or Design are normal entry backgrounds. Starting the CMD interdisciplinary specialization with a background in one of these areas is possible, but a background in two areas is favoured;

b) Admission to a Master’s degree program that includes the CMD specialization.

Doctor of Philosophy
a) A curriculum vitae;

b) A Masters degree from a recognized institution, or for exceptional students applying directly to the PhD program with a
Interdisciplinary Specializations

Bachelors degree, all the requirements for a Master’s degree (above) apply, plus demonstrated exceptional research and/or creative ability. These direct entry students will be considered on a case-by-case basis.

3. Application Deadline
The deadlines for the submission of complete applications correspond to the home program through which applicants have applied.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to the Faculty of Graduate Studies and the home program requirements, the Specialization requires:

Master's programs
Five half-course equivalents beyond the undergraduate degree level plus thesis or an installation/body of work.
Master's courses include:
- One graduate level course in either Design or Art
- One graduate level course in Computer Science
- One graduate level research methodology course
- Two other graduate level courses
- Additional courses may be required on a case-by-case basis as determined by the CMD Supervisor in the student’s first year of the interdisciplinary specialization
- A research/creative practice seminar
- CMD thesis and thesis defence (see sections 10 and 11 below)

Doctor of Philosophy
8 half-course equivalents beyond the undergraduate degree plus thesis or an installation/body of work.
PhD courses include:
- The five courses required for Master's programs with a specialization in CMD (advanced credit provided for these courses if a Master's degree with a specialization in CMD has been done)
- One graduate level course in either Environmental Design or Art
- One graduate level course in Computer Science
- One other graduate level course
- Additional courses may be required on a case-by-case basis as determined by the CMD Supervisor in the student’s first year of the interdisciplinary specialization
- CMD PhD Candidacy Examination (see section 11)
- A research/creative practice seminar
- CMD PhD thesis and CMD PhD thesis defence (see section 11)

6. Additional Requirements
A thesis component that describes research conducted and/or body of creative work must be completed during the CMD interdisciplinary specialization.

7. Credit for Undergraduate Courses
At most, one half course at the 500 level may be included as part of the course work requirement.
This must be recommended by the supervisor(s) and approved by the Director of the CMD interdisciplinary specialization on the appropriate form.

8. Time Limit
For the Master of Science with a specialization in CMD, the expected completion time is two years and the maximum completion time is four years. For the Doctor of Philosophy with a specialization in CMD, the expected completion time is four years and the maximum completion time is six years.

9. Supervisory Assignments
For simplifying the explanations in this document and for the purposes of CMD requirements, Fines Arts and Environmental Design are considered as one scholarly unit and referred to as Art & Design.
Generally, students are admitted to a specific research area and supervisor. Sometimes students are admitted to a specific lab or research area only, and are assigned an interim advisor.
Appointment of Supervisor(s): students will have an interim supervisor and co-supervisor appointed on their acceptance letter. Between the supervisor and the co-supervisor the disciplines of Computer Science, Arts and Design will be covered.
Students may seek a change in research area or supervisor after admission. The student must find permanent supervisors within six months of the start of the program. Such a change must be satisfactory to the student, and supported by the new supervisors and must be approved by the Director of the CMD interdisciplinary specialization.
The role of the supervisor is to take responsibility for over all guidance, instruction, and research/creative practice supervision. The role of the co-supervisor in this case is to provide supplementary guidance, instruction and research/creative practice supervision. This role is defined by a reading list. This reading list must be approved at least two months before the written and oral candidacy examinations.

a) A reading list: The scope of the candidacy exam is defined by a reading list. This reading list is prepared by the student and the student’s supervisors in consultation with the student’s supervisory committee. This reading list must be approved at least two months before the written and oral candidacy examinations.
b) A research proposal (see Section 11)
c) A written exam: The written examinations are taken by the candidate after course work is completed, and after approval of the doctoral proposal, and before the oral candidacy examination. The CMD written exam must be approved by the Director of the CMD interdisciplinary specialization, and consists of a take-home examination (normally 6-10 days).

D) A candidacy oral exam: The candidate’s reading list, completed written exam together with the research proposal, must be submitted to the examination committee at least 10 working days in advance of the candidacy oral exam. These documents form the basis for the candidacy oral exam.

PhD Thesis Oral Examination:
This exam will be conducted as specified by the Faculty of Graduate Studies. A thesis that describes the research conducted and/or the body of creative work completed is required to complete the PhD program. The thesis will set the research/work in its literary and new media context and present evidence that the work is worthy of either publication or external recognition. Graduating students must have demonstrated skills and

had supervisory experience at the doctoral level.

10. Required Examinations
Final thesis oral examinations are open.
Master’s Thesis Oral Examination:
This exam will be conducted as specified by the Faculty of Graduate Studies. A thesis component that describes research conducted and/or body of creative work completed is required to complete the Master's program. Graduating students will have to demonstrate skills and expertise in Computer Science and Arts & Design. CMD wants to encourage research and creative work that incorporates aspects of both Computer Science and Art & Design, thus there is recognition for and appreciation of a thesis that represents an interdisciplinary balance between the fields. The student’s internal examiner and external examiner will be from outside the CMD membership. Exceptions to this rule will be considered on an individual basis. At least one of the members of the Supervisory Committee should have had supervisory experience at the Master’s level. Normal Faculty of Graduate Studies rules about conflicts apply.

Ph.D. Candidacy Exam:
The candidacy exam is composed of:

a) A reading list: The scope of the candidacy exam is defined by a reading list. This reading list is prepared by the student and the student’s supervisors in consultation with the student’s supervisory committee. This reading list must be approved at least two months before the written and oral candidacy examinations.
b) A research proposal (see Section 11)
c) A written exam: The written examinations are taken by the candidate after course work is completed, and after approval of the doctoral proposal, and before the oral candidacy examination. The CMD written exam must be approved by the Director of the CMD interdisciplinary specialization, and consists of a take-home examination (normally 6-10 days).

D) A candidacy oral exam: The candidate’s reading list, completed written exam together with the research proposal, must be submitted to the examination committee at least 10 working days in advance of the candidacy oral exam. These documents form the basis for the candidacy oral exam.

PhD Thesis Oral Examination:
This exam will be conducted as specified by the Faculty of Graduate Studies. A thesis that describes the research conducted and/or the body of creative work completed is required to complete the PhD program. The thesis will set the research/work in its literary and new media context and present evidence that the work is worthy of either publication or external recognition. Graduating students must have demonstrated skills and

had supervisory experience at the doctoral level.
Interdisciplinary Specializations

expertise in Computer Science and Arts & Design. CMD encourages research and creative work that incorporates aspects of both Computer Science and Art & Design; thus there is recognition for and appreciation of a thesis that represents an interdisciplinary balance between the fields. The student’s Internal Examiner will be a Faculty member from the University of Calgary but outside of the CMD membership. The student’s External Examiner will be an internationally recognized expert in the research/creative practice area of the student’s research. Normal Faculty of Graduate Studies rules about conflicts apply.

11. Research Proposal Requirements
Research proposal requirements are determined by the supervisor at the Master’s level. At the Doctoral level, a research proposal, approved by the student’s supervisory committee, must be submitted to the Director of the CMD interdisciplinary specialization at least two weeks before the departmental written exam begins. The research proposal will contain an abstract, a literature survey (including an analysis of the literature), an overview of the proposed research, a plan for completing the proposed research, and references.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards see the Awards and Financial Assistance section of the calendar. Successful applicants may be offered departmental teaching assistantships and/or research assistantships in their letter of offer. Students applying for scholarships must submit their application as appropriate, according to the requirements of the scholarship.

14. Other Information
None.

15. Faculty Members/Research Interests
Information on faculty research interests may be found at: http://www.cmd.ucalgary.ca/Research/

Registration in all graduate courses requires the approval of Computational Media Design. CMD students are eligible to take any course in Computer Science, Fine Arts, and Environmental Design, provided they have the necessary prerequisites.

Energy & Environmental Systems Interdisciplinary Specialization EESS
Contact Information
Location: Earth Sciences Building, Room 602
Faculty number: 403.220.8872
Fax: 403.210.3894
E-mail address: eespinfo@ucalgary.ca
Web page URL: http://www.ucalgary.ca/ees

1. Degrees and Specializations Offered
The University offers an interdisciplinary specialization in Energy and Environmental Systems to students registered in an existing graduate program currently offered through one of the following Faculties that are affiliated with the Institute for Sustainable Energy, Environment and Economy (ISEEE):
- Schulich School of Engineering
- Faculty of Environmental Design
- Haskayne School of Business
- Faculty of Law
- Faculty of Science
- Faculty of Arts

The student will receive the degree offered by the home graduate program:
- Doctor of Philosophy (PhD)
- Master of Arts (MA), thesis-based
- Master of Laws (LLM), thesis-based
- Master of Science (MSc), thesis-based
- Master of Geographic Information Systems (MGIS), course-based
- Specialization: Energy and Environmental Systems (Interdisciplinary)

In cases where the student’s proposed research area cannot be supported through a single academic program, and which would necessitate the combination of at least three academic areas, they may seek admission and earn the EES specialization through the Interdisciplinary Graduate Program (IGP) of the Faculty of Graduate Studies.

2. Admission Requirements
In addition to the Faculty of Graduate Studies and the home graduate program’s requirements, students undertaking the EES specialization must successfully complete the following:

EES Specialization at the Master’s Level (thesis-based)

Required core courses:
- Energy and Environmental Systems 601: Introduction to Energy and Environmental Systems
- Energy and Environmental Systems 603: Project Course
- Energy and Environmental Systems 605: Graduate Seminar
- Energy and Environmental Systems 607: Tools for System Analysis (block week course)

Depending on their home program and area of study, students may take additional Energy and Environmental Systems related courses in consultation with their research supervisor.

Note: In accordance with Faculty of Graduate Studies’ regulations, students in thesis-based programs may obtain a reduction in course load. This may be appropriate in cases where there is overlap between Energy and Environmental Systems courses and the home graduate program’s course requirements. Such requests may be agreed to by the student’s supervisor, and be submitted to and approved by the Graduate Coordinator of the home graduate program.
and the EES Program Director or designated EES Committee Member.

**EES Specialization with MGIS Degree (course-based)**

Students enrolled in the Master of Geographic Information Systems (MGIS) degree program who wish to earn the EES specialization will need to take three of the EES Core Courses (Energy and Environmental Systems 601, 603, and 605). Students are not required to take Geography 683, but must take the other core courses in the MGIS program (Geography 647, 633, 639, and 681). Finally, students will still be required to fulfill the 10 half course requirement of the MGIS program, and can select the remaining three courses from Geography optional courses or EES related courses. It is not recommended that students required to complete the MGIS upgrade courses undertake the EES specialization.

**EES Specialization at the Doctoral Level**

Doctoral students are required to take the same Energy and Environmental Systems core courses that are required at the Master’s level, if they have not previously completed the EES specialization. Doctoral students must also comply with requirements of their home graduate program. Students who have previously earned a Master’s degree with the EES specialization have no other required Energy and Environmental Systems courses. However, they may need to take courses relevant to their area of study as recommended by their thesis supervisor. Doctoral students may seek a reduction in course load as per the rules for thesis-based Master’s students shown above.

**EES Specialization with the Interdisciplinary Graduate Program (IGP)**

The course curriculum for IGP students will be determined at the IGP admission seminar. Course requirements will normally include the EES core courses, but may also include other courses to ensure adequate coverage of the relevant disciplines involved. Changes to the student’s curriculum after the admission seminar will require the approval of the Supervisory Committee, IGP Director, and the Faculty of Graduate Studies.

**6. Additional Requirements**

None.

**7. Credit for Undergraduate Courses**

Students are allowed to take only one 500-level course for graduate credit, subject to the approval of the EES Program Director. Graduate students taking a 500-level course for graduate credit will be required to complete additional assignments.

**8. Time Limit**

Expected completion time for a Master’s degree is two years and the maximum completion time is four years.

Expected completion time for the PhD degree is four years and the maximum completion time is six years.

**9. Supervisory Assignments**

Students must have a formal supervisor appointed to them within twelve months of beginning the EES specialization. Supervisory arrangements must be approved by the EES Program Director.

**10. Required Examinations**

Final thesis orals follow the requirements of the Faculty of Graduate Studies and the home graduate program.

Students in doctoral programs must fulfill the written candidacy examination requirement of the home graduate program. All doctoral students must complete the candidacy oral examination in accordance with Faculty of Graduate Studies’ regulations.

**11. Research Proposal Requirements**

Doctoral students and thesis-based Master’s students must present a written and oral research proposal to their supervisory committees no later than twelve (Master’s) and twenty (PhD) months after initial registration. The research proposal must be submitted to the EES Program Director for approval and placed on file.

This requirement of research proposal approval does not apply to students pursuing the EES specialization through the Interdisciplinary Graduate Program, since the research proposal must be approved as part of IGP’s admission process.

**12. Special Registration Information**

None.

**13. Financial Assistance**

Financial assistance will be available to all qualified full-time graduate students. Students are also encouraged to seek funding opportunities through the Faculty of Graduate Studies’ Open Scholarship Competition (contact the home program for application deadlines), as well as external funding agencies.

**14. Other Information**

Given limited resources, the specialization may, in any year, admit fewer applicants than those who are qualified to undertake graduate studies.

**15. Faculty Members/Research Interests**

See the Web site of the home department of the faculty member.

For biographies and research interests of those faculty directly associated with the Energy and Environmental Systems Group, visit http://www.ucalgary.ca/EES/People.

**Engineering, Energy & Environment ENEE**

**Contact Information**

Location: Information & Communications Technology Building, Room ICT248

Faculty number: 403.210.9892

Fax: 403.210.9892

E-mail address: ceere@ucalgary.ca

Web page URL: http://www.schulich.ucalgary.ca/CEERE/

The Centre for Environmental Engineering Research and Education (CEERE) in the Schulich School of Engineering (SSE) has the overall responsibility for the coordination and delivery of a comprehensive postgraduate program specialization in the multidisciplinary field of energy & environment. All five engineering departments participate in delivering this SSE-wide specialization.

Applications for admission to the Faculty of Graduate Studies should be submitted to the engineering department that best matches the applicant’s undergraduate and/ or postgraduate academic training.

**1. Degrees and Specializations Offered**

Degrees with an interdisciplinary specialization in Energy & Environment:

- Doctor of Philosophy (PhD)
- Master of Science (MSc), thesis-based
- Master of Engineering (MEng), thesis-based and course-based

**2. Admission Requirements**

In addition to the Faculty of Graduate Studies, SSE, and home department requirements, the Energy & Environment specialization requires:

- Master of Engineering and Master of Science

A Bachelor's degree in engineering

Note: Applicants with applied science degrees may be considered, but additional undergraduate engineering courses may be required.

- Doctor of Philosophy

A Master’s degree in engineering

Note: Transfer to the doctoral program without completing the Master’s degree may be approved for exceptional students.

**3. Application Deadline**

See departmental and program sections in this Calendar for deadlines regarding submission of complete applications for students with international transcripts or with Canadian and US transcripts.

**4. Advanced Credit**

See “Engineering Programs”.

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**Interdisciplinary Specializations**
Interdisciplinary Specializations

5. Program/Course Requirements
In addition to Faculty of Graduate Studies requirements and to the course requirements described below, students should consult their “home” department in the Schulich School of Engineering for any additional program or course requirement(s).

Master of Engineering (Course-based Route)
Ten half courses of which a minimum of six must be graduate half courses. At least four courses must be selected from a list of courses related to Energy & Environment available from CEERE.

Students with non-engineering undergraduate degrees may be required to take additional prerequisite courses at the undergraduate level.

Master of Engineering (Thesis-based Route)
A minimum of four graduate half courses. At least two courses must be selected from a list of courses related to Energy & Environment available from CEERE.

Students with non-engineering undergraduate degrees may be required to take additional prerequisite courses at the undergraduate level.

Master of Science
A minimum of four graduate half courses. At least two courses must be selected from a list of courses related to Energy & Environment available from CEERE.

Students with non-engineering undergraduate degrees may be required to take additional prerequisite courses at the undergraduate level.

Doctor of Philosophy
For applicants with Bachelor of Science and Master of Science degrees in Engineering:
A minimum of two graduate half courses. At least one course must be selected from a list of courses related to Energy & Environment available from CEERE.

For applicants with a Bachelor’s degree in Engineering, but without a completed Master’s degree:
A minimum of six graduate half courses. At least three courses must be selected from a list of courses related to Energy & Environment available from CEERE.

Students with non-engineering undergraduate degrees may be required to take additional prerequisite courses at the undergraduate level.

6. Additional Requirements
Not applicable.

7. Credit for Undergraduate Courses
Not applicable.

8. Time Limit
Expected completion time is two years for the Master of Science degree, and three years for the Doctor of Philosophy. Maximum completion time is four years for the Master of Science and Master of Engineer-
ing (Thesis) degrees and six years for the Master of Engineering (Courses Only) and Doctor of Philosophy degrees.

9. Supervisory Assignments
All students are required to have a thesis supervisor before the second annual registration. For students in the Master of Science and Doctor of Philosophy degree programs, a supervisor is normally appointed at the time of admission.

10. Required Examinations
All final thesis oral examinations involve a public seminar/presentation before a closed oral examination.

11. Research Proposal Requirements
None.

12. Special Registration Information
None.

13. Financial Assistance
See “Engineering Programs”.

14. Other Information
See “Engineering Programs”.

15. Faculty Members/Research Interests
The current research interests of the faculty members can be found at http://www.schulich.ucalgary.ca/CEERE/ or from the various engineering departments.

Environmental Engineering ENEN

Contact Information
Location: Information & Communications Technology Building, Room ICT248
Faculty number: 403.210.9892
Fax: 403.210.9892
E-mail address: ceere@ucalgary.ca
Web page URL: http://www.schulich.ucalgary.ca/CEERE/
The Centre for Environmental Engineering Research and Education (CEERE) in the Schulich School of Engineering (SSE) has the overall responsibility for the coordination and delivery of a comprehensive postgraduate program specialization in the multi-disciplinary field of environmental engineering. All five engineering departments participate in delivering this SSE-wide environmental engineering specialization.

Applications for admission to the Faculty of Graduate Studies should be submitted to the engineering department that best matches the applicant’s undergraduate and/or postgraduate academic training.

1. Degrees and Specializations Offered
Degrees with an interdisciplinary specialization in Environmental Engineering:
Doctor of Philosophy (PhD)
Master of Science (MSc), thesis-based

Master of Engineering (MEng), thesis-based and course-based

2. Admission Requirements
In addition to the Faculty of Graduate Studies, SSE, and home department requirements, the Environmental Engineering specialization requires:

Master of Engineering and Master of Science
A Bachelor’s degree in engineering.

Note: Applicants with applied science degrees may be considered, but additional undergraduate engineering courses may be required.

Doctor of Philosophy
A Master’s degree in engineering, preferably in environmental engineering or equivalent.

Note: Transfer to the doctoral program without completing the Master’s degree may be approved for exceptional students.

3. Application Deadline
See departmental and program sections in this Calendar for deadlines regarding submission of complete applications for students with international transcripts or with Canadian and US transcripts.

4. Advanced Credit
See “Engineering Programs”.

5. Program/Course Requirements
In addition to Faculty of Graduate Studies requirements and the course requirements described below, students should consult their “home” department in the Schulich School of Engineering for any additional program or course requirement(s).

Master of Engineering (Courses-based Route)
Ten half courses. Environmental Engineering 603 and 605 are normally required, together with at least one of Environmental Engineering 621, 623, 625 or 627. Environmental Engineering 601 is not required.

Students with non-engineering undergraduate degrees may be required to take additional prerequisite courses at the undergraduate level.

Master of Engineering (Thesis-based Route)
A minimum of five half courses. Environmental Engineering 603 and 605 are normally required, together with at least one of Environmental Engineering 621, 623, 625 or 627. Environmental Engineering 601 is not required.

Students with non-engineering undergraduate degrees may be required to take additional prerequisite courses at the undergraduate level.
Interdisciplinary Specializations

Master of Science
A minimum of five half courses plus Environmental Engineering 601. Environmental Engineering 603 and 605 are normally required, together with at least one of Environmental Engineering 621, 623, 625 or 627.

Doctor of Philosophy
For applicants with Bachelor of Science and Master of Science degrees in Environmental Engineering:
A minimum of three half courses plus Environmental Engineering 601. One of Environmental Engineering 621, 623, 625 or 627 is normally required.

For applicants with Bachelor of Science and Master of Science degrees in Engineering, but not Environmental Engineering:
A minimum of four half courses and Environmental Engineering 601. Environmental Engineering 603 and 605 are normally required, together with at least one of Environmental Engineering 621, 623, 625 or 627.

For applicants with a Bachelor’s degree in Engineering, but without a completed Master’s degree:
A minimum of eight half courses plus Environmental Engineering 601. Environmental Engineering 603 and 605 are normally required, together with at least two of Environmental Engineering 621, 623, 625 or 627.

6. Additional Requirements
All full-time Master of Science and Doctor of Philosophy students are required to register and participate in the Research Seminar course, Environmental Engineering 601, in each of the Fall and Winter Terms.

7. Credit for Undergraduate Courses
Not applicable.

8. Time Limit
Expected completion time is two years for the Master of Science degree, and three years for the Doctor of Philosophy. Maximum completion time is four years for the Master of Science and Master of Engineering (thesis-based) degrees and six years for the Master of Engineering (course-based) and Doctor of Philosophy degrees.

9. Supervisory Assignments
All students are required to have a thesis supervisor before the second annual registration. For students in the Master of Science and Doctor of Philosophy degree programs, a supervisor is normally appointed at the time of admission.

10. Required Examinations
All final thesis oral examinations involve a public seminar/presentation before a closed oral examination.

11. Research Proposal Requirements
None.

12. Special Registration Information
None.

13. Financial Assistance
See “Engineering Programs”.

14. Other Information
See “Engineering Programs”.

15. Faculty Members/Research Interests
The current research interests of the faculty members can be found at http://www.schulich.ucalgary.ca/CEERE/ or from engineering departments.

Israel Studies ISST

Contact Information
Dr. David Tal
Kahanoff Chair in Israel Studies
Location: SS 646
Faculty number: 403.220.6405
Fax: 403.282.8606
E-mail address: dtal@ucalgary.ca
Web page URL: http://ss.ucalgary.ca/istt/

1. Degrees and Specializations Offered
The University offers an interdisciplinary specialization in Israel Studies to students registered in an existing graduate program. The student will receive the degree offered by the home program.

Master of Arts (MA)
Specialization: Israel Studies (Interdisciplinary)

2. Admission Requirements
In selecting students for the program, a broad range of disciplinary backgrounds will be considered as well as relevant experience. Upon application to an existing program students must contact the Israel Studies Program Director. All applicants must meet the requirements of the Faculty of Graduate Studies and the home program. In addition applicant must send the Israel Studies Program:

a) A copy of a graded writing sample;
b) A 250-word (minimum) statement of research interest including research topics in the field and reasons for pursuing a graduate degree with a specialization in Israel Studies.

3. Application Deadline
The deadlines for the submission of complete applications correspond to the home program through which applicants have applied.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
In addition to the Faculty of Graduate Studies and the home program requirements, the Program requires:

Master of Arts
a) A minimum of one year of full-time study at the University of Calgary
b) Three full-course equivalents:
   - Israel Studies 601 (half course)
   - One full-course equivalent in the student’s disciplinary focus
   - One appropriate methods course in the focus discipline - for example, History 690 or Political Science 691 (half course)

One full-course equivalent in Israel Studies options, to be chosen from:
- English 607.14
- English 607.17
- History 515
- History 691
- Political Science 596.74
- Political Science 675.01
- Political Science 681
- Religious Studies 601
- Religious Studies 681
- Strategic Studies 651 (topic focused on Israel)
- Strategic Studies 653 (topic focused on Israel)

Course selection will be made in consultation with the Israel Studies Program Director and in relation to the student’s field of thesis research.

8. Time Limit
Expected completion time is two years.

9. Supervisory Assignments
Students will be assigned a supervisor upon admission.

10. Required Examinations
Final thesis oral examinations are open.
Interdisciplinary Specializations

11. Research Proposal Requirements
Within twenty months of entering the program, the student, with the supervisor’s advice, develops a thesis research proposal to be submitted to the Program Director for approval and placed on file.

12. Special Registration Information
None.

13. Financial Assistance
Financial assistance may be available to qualified students. For information on awards, see the Awards and Financial Assistance section of this Calendar.

Students applying for scholarships must submit their applications to the Program in accordance with the home department deadline.

14. Other Information
Given the limited resources, the Program may, in any year, admit fewer applicants than those who are qualified to undertake graduate studies.

Reservoir Characterization

RSCH

Contact Information
Contact the departments of Geoscience or Chemical and Petroleum Engineering for further information.

Department of Chemical and Petroleum Engineering
Location: Schulich School of Engineering, Room B202
Phone: 403.220.4802
Fax: 403.284.4852
Email Address: gradstud.ucalgary.ca
Web page URL: http://www.chem.ucalgary.ca/

Chemical Engineering

Department of GeoScience
Location: Earth Sciences 118
Phone: 403.220.3254
Fax: 403.284.0074
Email Address: geosciencegrad@ucalgary.ca
Web page URL: http://www.geo.ucalgary.ca

1. Degrees and Specializations Offered
The University offers an interdisciplinary specialization in Reservoir Characterization to students registered in an existing course-based Master’s program in the Departments of Chemical and Petroleum Engineering or GeoScience. The program integrates reservoir engineering, geology, geophysics, and reservoir characterization. The student will receive the degree offered by the home program:
Master of Engineering in Chemical and Petroleum Engineering (MEng), or
Master of Science (MSc) (Geology and Geophysics)
Specialization: Reservoir Characterization (Interdisciplinary)

All students will normally be considered to have full-time status. In exceptional circumstances part-time status may be considered and must be approved by the Graduate Director.

2. Admission Requirements
In addition to Faculty of Graduate Studies requirements, all applicants must meet the minimum standards of the home program.
Acceptance into the Master of Engineering program would normally require the completion of the equivalent of the Bachelor of Science in Oil and Gas Engineering degree offered by the University of Calgary. However, individuals with more diverse background and industry experience may be considered for admission.
Acceptance into the Master of Science program requires the completion of a Bachelor of Science in Geology and Geophysics plus Petroleum Engineering 507 – Well Logging and Formation Evaluation, or equivalent.
Applicants with an undergraduate degree in geology must demonstrate acceptable proficiency in mathematics. It is an asset for geologists to have taken additional mathematics courses as technical electives during their undergraduate degree.

3. Application Deadline
See departmental listings for the deadlines for the submission of complete applications.

4. Advanced Credit
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree/diploma or for courses taken to bring the grade point average to a required level for admission.

5. Program/Course Requirements
To address the broad background of students entering the Reservoir Characterization Interdisciplinary Specialization, there are three streams for completion: Geology, Geophysics, and Engineering.
All students must take at least six courses at the 600- and/or 700-level.

Students in the engineering stream are required to take:
Geophysics 559 – Geophysical Interpretation
Chemical Engineering 621 – Reservoir Simulation
Chemical Engineering 661 – Geostats for Reservoir Characterization OR Geology 697 – Advanced Geostatistics
Chemical Engineering 698/Geology 698*** – Reservoir Characterization for Field Development (RCFD)
Human Resources and Organizational Dynamics 789 – Optimizing Team Dynamics and select 4 from the following list, 2 of which MUST be geoscience:
Petroleum Engineering 543 – Geological Characterization of Oil and Gas Reservoirs
Chemical Engineering 687 – Petroleum Economics
Chemical Engineering 649 – Naturally-Fractured Reservoirs
Geology 595.03 – Reservoir Evaluation and Hydrocarbon Play Assessment
Geology/Geophysics 649 – Petrophysical Techniques
Geology/Geophysics 699.37 – Unconventional Gas Reservoir Characterization and Evaluation

Students in the geophysics stream are required to take
Petroleum Engineering 523 – Intro to Reservoir Engineering
Chemical Engineering 621 – Reservoir Simulation
Chemical Engineering 661 – Geostats for Reservoir Characterization OR Geology 697 – Advanced Geostatistics

* Credit will not be given for course work in accordance with the home department minimum standards of the home program.

+ Professionally recognized degrees in the equivalent of the Bachelor of Science in Engineering or Geology.

** Students in the geology stream are required to take
Geology 593.03 – Stratigraphy and Sedimentation of clastic rocks (Q)
Geology 593.04 – Stratigraphy and Sedimentation of carbonate rocks (Q)

*** Students in the geology stream are required to take
Geology 649 – Geological Characterization of Oil and Gas Reservoirs
Geology 697 – Advanced Geostatistics

Information given therein shall be subject to change at any time.
Chemical Engineering 698/Geology 698*** – Reservoir Characterization for Field Development (RCFD)

Human Resources and Organizational Dynamics 789 – Optimizing Team Dynamics and select 4 from the following list, 2 of which MUST be engineering:

Engineering 407 – Numerical Methods in Engineering
Petroleum Engineering 513** – Flow in Porous Media
Petroleum Engineering 525 – Waterflooding and Enhanced Oil Recovery
Petroleum Engineering 533 – Petroleum Production Engineering
Petroleum Engineering 543 – Geotechnical Characterization of Oil and Gas Reservoirs
Chemical Engineering 687 – Petroleum Economics
Chemical Engineering 649 – Naturally-Fractured Reservoirs
Geology 613** – Flow in Porous Media
Geology 595.03 – Reservoir Evaluation and Hydrocarbon Play Assessment
Geology/Geophysics 649 – Petrophysical Techniques
Geology/Geophysics 699.37 – Unconventional Gas Reservoir Characterization and Evaluation
Geology 593.02 – Stratigraphy and Sedimentation of clastic rocks (Q)*
Geology 593.03 – Stratigraphy and Sedimentation of carbonate rocks (Q)*

* (Q) = quarter course taught in ½ semester; Geology 593.02 and.03 must both be taken for program credit.
** Choose only one (1) of Petroleum Engineering 513 or Geology 613.
*** To be taken in the final semester of study

The RCFD course is a team-based experience with each team required to analyze and integrate various data (e.g., seismic, logs, and production) from a real field. Each member of the team is expected to have proficiency on the software packages for geophysical interpretation, geological mapping, geostatistical modeling and reservoir flow modeling. The reservoir characterization will require the development and assessment of a geostatistical model of the field that will be used for a history match and to propose future development. The project will conclude with a formal presentation to experts from both academia and industry.

6. Additional Requirements
None.

7. Credit for Undergraduate Courses
The applicant must make advanced credit requests as part of the admission process. Credit will not be given for course work taken as part of another completed degree or diploma program, or for courses taken to bring the grade point average to the required level for admission.

8. Time Limit
Expected completion time is two years and maximum completion time is six years.

9. Supervisory Assignments
Supervisors will be approved by the specialization Graduate Program Director.

10. Required Examinations
After the conclusion of the Capstone Project, there will be a comprehensive oral examination of each student before an examining committee that includes a faculty member from each of the three disciplines. Each student will be expected to express in-depth knowledge in his/her area of expertise (engineering, geology, geophysics), and to have a comprehensive knowledge of the significance of the other two areas in successful reservoir characterization.

11. Research Proposal Requirements
None.

12. Special Registration Information
None.

13. Financial Assistance
For information on awards, see the Awards and Financial Assistance section of this Calendar.

14. Other Information
None.

15. Faculty Members/Research Interests
See the website of the home department of the faculty members.
The University of Calgary is very proud of its Graduate Student Awards program. In addition to recognizing academic achievement, scholarships are important in helping to bridge the gap between the rising cost of attending university and limited student income. Attracting top national and international students to the University of Calgary continues to be a very high priority.

We are extremely pleased that our donors share our commitment to graduate student awards, and we greatly appreciate the financial support offered by all of our valued donors. Full-time students registered in a graduate degree program at the University of Calgary are eligible for awards and financial assistance.

Scholarship information, application forms and instructions are found through the searchable awards database on the web at http://grad.ucalgary.ca/awards

Additional information is available from your program. Because this Awards List is published a considerable time before the opening of the session, the University reserves the right to make whatever changes circumstances may require, including cancellation or addition of particular awards.

I. University Assistantships

University Graduate Assistantships are governed by the Collective Agreement between the Governors of the University of Calgary and the Graduate Students’ Association. Each year teaching units have available varying numbers of graduate assistantships to be awarded on the basis of merit. Individuals interested in such appointments should contact the appropriate program administrator for information about eligibility, application deadlines and procedures. The stipends are arranged directly between graduate students and their prospective supervisors.

II. Project Employment

A Graduate Project Employee (GPE) is funded from a trust account to provide a direct service in connection with a faculty member’s research. The research is normally not related to the student’s program and/or area of research. The service provided is normally supervised by someone other than the student’s supervisor and is treated as regular employment.

III. Sessional Instructorship

A department or faculty may appoint a graduate student as a Sessional Instructor to teach a course as Instructor of Record. Sessional Instructor appointments are Term Certain Appointments covered under the Collective Agreement between the Governors of the University of Calgary and the University of Calgary Faculty Association (www.ucalgary.ca/HR/policies/academic.html). Normally, a student may not be a Sessional Instructor for more than one half-course or one full course at any one time.

IV. Dean’s Entrance Scholarships (DES)

Awarded to Canadian or international students with excellent academic records and potential who will be entering a doctoral program at the University of Calgary. Successful candidates must be registered full time in the Graduate Faculty of Studies at the time of tenure. Students receiving this award must hold or apply for major awards from such funding agencies as: NSERC, SSHRC, CIHR and Alberta Innovates, if eligible.

Graduate programs allocate these awards, and students should check with the program administrator for application procedures.

V. Faculty of Graduate Studies Scholarships (FGSS)

To be eligible for a Faculty of Graduate Studies Scholarship, students must be registered full-time in the Faculty of Graduate Studies in a thesis program at the University of Calgary. Graduate programs allocate these awards, and students should check with the program administrator for application procedures.

VI. Graduate Students’ Association Bursaries

The Graduate Students’ Association makes available bursaries of up to $1,000 per year to students who at the time of tenure will be registered in a graduate program at the University of Calgary and can demonstrate financial need. Application forms are available from the Graduate Students’ Association, 350 MacEwan Student Centre, telephone 403.220.5997. Contact the GSA office for further information.

VII. Government Financial Assistance

The provincial and federal governments make assistance available to students in the form of loans. Students must be Canadian citizens or Permanent Residents of Canada and provide sufficient evidence that financial assistance is essential to enable the student to continue her/his education. The amount of assistance varies. Students should contact their provincial funding office directly to obtain detailed information about the student loans, grants and bursaries offered through their province. Links to the out of province government loan websites
are available from the Student Awards and Financial Aid website: www.ucalgary.ca/awards.

VIII. International Students
International students planning to do graduate work at the University of Calgary should be aware that a number of Canadian scholarship programs require Canadian citizenship or permanent residence status. However, the Government of Canada does support a number of programs designed to assist individuals who wish to study in Canada on a Study Permit. These programs are usually organized through agencies of the individual’s own government, and prospective students are encouraged to explore these possibilities. International students may apply for Graduate Assistantships, Graduate Teaching Fellowships and FGS Scholarships.

IX. Awards Offered by Government, Industry and Others
Many foundations, companies, professional organizations and other agencies offer financial support to graduate students. A number of international, national and provincial organizations award scholarships and fellowships, tenable at this and other universities. Details about many of these awards are available from the Graduate Awards Database which is found through the MyUofC portal or at http://grad.ucalgary.ca/awards. The Faculty of Graduate Studies Scholarships and fellowships are awarded on the basis of academic standing and demonstrated potential for advanced study and research. Normally, only Master’s students in the first two years of program and doctoral students in the first four years of program are eligible to hold scholarships. If, in the opinion of the Graduate Scholarship Committee, a suitable candidate cannot be found, it reserves the right not to award any one or any number of scholarships in any year. Unless otherwise stated, awards are for one year only. The value and terms of the awards are subject to change without notice. Written requests, endorsed by the supervisor and Graduate Program Director, for off-campus tenure of awards should be submitted to the Dean of Graduate Studies. Notification of award is sent electronically to successful candidates as soon as possible after the adjudication. All award winners are asked to accept or decline the offer through the Student Centre as soon as possible and no later than the deadline stated in the notification of award. All award payments begin in September unless otherwise stated in the terms of reference. Should it become known that a student is unqualified for any reason, the University reserves the right to terminate the award(s) and funds already paid out must be returned.

X. University Research Grants - Committee Thesis Research Grants
The University Research Grants Committee recognizes that there are instances where the ordinary resources for thesis research available through a program or faculty may not be adequate to attend to certain special needs of a particular thesis research project or where unpredictable circumstances have made it impossible to provide funds from current budgets.

Thesis Research Grants are made to assist graduate students with the acquisition of special equipment, services or materials or for fieldwork essential to the conduct of their thesis projects. These awards are competitive. An application guide and the application form may be found at http://www.ucalgary.ca/research/files/research/The-sis%20Dissertation%20App.pdf. Further information is available through the Office of Research Services, Main Floor, 3512 33 St. NW, University Research Park Calgary, Alberta. Telephone 403.220.6354.

XI. Conference Travel Grant (Graduate Students)
Graduate Student Travel Awards are made to assist graduate students in presenting the results of their thesis research at significant scientific or scholarly meetings, and equally, to provide students with an opportunity to gain experience in conference presentation and to meet colleagues in universities and industries who will of importance to their future careers.

Canadian and permanent residents will apply through the Faculty of Graduate Studies. Information and the application form may be found at http://grad.ucalgary.ca/awards. International students will apply through the Office of Research Services Main Floor, 3512 33 St, NW, University Research Park Calgary, Alberta. Telephone: 403.220.6354, http://www.ucalgary.ca/research/funding/internalgrants.

XII. Awards in the Faculty of Graduate Studies

<table>
<thead>
<tr>
<th>Amount of Award</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to $2,500</td>
<td>One lump sum payment</td>
</tr>
<tr>
<td>$2,501 to $6,000</td>
<td>Paid in equal monthly installments over a four month term</td>
</tr>
<tr>
<td>$6,001 to $10,000</td>
<td>Paid in equal monthly installments over eight months</td>
</tr>
<tr>
<td>Awards over $10,000</td>
<td>Paid in equal monthly installments over twelve months</td>
</tr>
</tbody>
</table>

If a student has a successful final oral examination during the tenure of a scholarship, the award will be terminated at the end of the month in which the thesis is submitted to the Faculty of Graduate Studies, unless otherwise specified in the terms of reference of the award, or at the date of the termination of the award, whichever comes first.

No student can receive a total of more than the minimum tri-council scholarship value (currently $17,300) from awards made in the Izaak Walton Killam Doctoral, Open Doctoral, Special Awards and Bursaries competitions, and Program Recommended Awards. A student holding external awards with a total value equal to or greater than the minimum tri-council scholarship is not eligible for funding from the Special Awards and Bursaries competition, Program Recommended awards or the Open Doctoral competition (with the exception of an Honorary Izaak Walton Killam Doctoral Scholarship).

A student who is awarded both a University of Calgary scholarship (or combination of awards) and an external award equal to or greater than the amount stated above must take up the external award at the earliest possible date and decline the University of Calgary scholarship(s) effective on that same date. In such a case, a student may include the offer of the forfeited award on a curriculum vitae.

The Dean’s Entrance Scholarship (DES), Graduate Teaching Fellowships (GTF) and Travel Awards are not subject to the limits just described. Similarly, funds awarded by programs from their Graduate Student Support allocation are not subject to this limit. Before accepting other forms of awards or remuneration, especially those involving service, students must check with the Graduate Scholarship Office, to ensure that acceptance of the award does not affect the holder’s full-time registration status.

Students holding multiple year funding must submit a Scholarship Progress Report to the Faculty of Graduate Studies Scholarship Office not later than the end of the eleventh month of the registration year.
<table>
<thead>
<tr>
<th>Adjudication Process</th>
<th>Method of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Izaak Walton Killam Pre-Doctoral Scholarship Competition</td>
<td>On-line application: <a href="http://grad.ucalgary.ca/awards">http://grad.ucalgary.ca/awards</a> Supporting documents sent to the graduate program in which the student will be registered. Contact the graduate program administrator for more information.</td>
</tr>
<tr>
<td>Open Doctoral Scholarship Competition</td>
<td>On-line application: <a href="http://grad.ucalgary.ca/awards">http://grad.ucalgary.ca/awards</a> Supporting documents sent to the graduate program in which the student will be registered. Contact the graduate program administrator for more information.</td>
</tr>
<tr>
<td>Recommended by Program</td>
<td>Variable, check the terms of reference <a href="http://www.grad.ucalgary.ca/">http://www.grad.ucalgary.ca/</a> or with the graduate program administrator for details.</td>
</tr>
<tr>
<td>Special Awards Competition</td>
<td>On-line application: <a href="http://grad.ucalgary.ca/awards">http://grad.ucalgary.ca/awards</a> Supporting documents sent to the graduate program in which the student will be registered. Contact the graduate program administrator for more information.</td>
</tr>
<tr>
<td>Bursary Competition</td>
<td>On-line application: <a href="http://grad.ucalgary.ca/awards">http://grad.ucalgary.ca/awards</a> Supporting documents sent to the graduate program in which the student will be registered. Contact the graduate program administrator for more information. NOTE: Applicants must show financial need commensurate with the value of the award.</td>
</tr>
</tbody>
</table>

Full Terms of Reference and application documents for each award are available through the searchable database tool, found on the web at http://www.grad.ucalgary.ca/.

Graduate Scholarship Office  
Faculty of Graduate Studies  
University of Calgary  
Earth Sciences 702  
2500 University Drive NW  
Calgary AB T2N 1N4  

**Important note:** Scholarship payments cannot be made if the student has not registered for the upcoming academic year. Students who have been awarded scholarships and other awards should register as soon as possible to ensure timely payment.
Student 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 Academic Foundations of the U of C.

Our services exist so that you, as a University of Calgary student, can make the most of your experience at our university. We see students through from the moment they make contact with us as a prospective student through to graduation and beyond. To achieve our mission we adhere to the highest standards of personal, interpersonal and professional behavior and we comply with all institutional and legal requirements.

We stand on four core values:

- **Community**: We endeavor to develop a University community that promotes lifelong citizenship and societal engagement.
- **Development**: We foster an environment that inspires self-confidence, nurtures personal achievement and actively connects the student experience and the classroom.
- **Diversity**: We recognize that our campus community is diverse and we celebrate this rich environment.
- **Accountability**: We recognize that as individuals we are responsible for our actions, learning, development and the impact we have on others.

We are committed to involving students in our planning and our decision-making, and encourage you to make contact with our departments and staff members if you have any ideas, comments or questions.

Ann Tierney
Vice-Provost (Students)
Contact Information:
Vice-Provost (Students): Ann Tierney BA(Hons), LLB, MA
Telephone: 403.220.6580
Fax: 403.220.6800
Location: Suite A 100
Associate Vice-Provost (Enrolment) and Registrar: David Johnston, BA, MA
Telephone: 403.220.3833
Fax: 403.289.1253

Location: Mackinnie Library Block 117
Website: http://www.ucalgary.ca/ese/

Recruitment and Admissions

Director, Undergraduate Admissions: Elaine Wong
Senior Recruitment Coordinator: Jill MacBeath

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 admissions advising
- Presentations at Canadian high schools
- Attendance at education or career fairs
- Hosting application and admission workshops

Other services provided are:

- Centralized undergraduate application and admission services for both domestic and international applicants to programs offered by nine faculties
- Evaluation of domestic and foreign credentials for purposes of admission and transfer credit
- Coordination and facilitation of requests for transfer credit agreements from other Alberta post-secondary institutions

Telephone: 403.210.ROCK (7625)
Fax: 403.220.0762
Location: MacKinnie Library Block 117
Website: http://www.ucalgary.ca/prospectivestudents

Career Services

Director: Martina Payette

Career Services facilitates on-campus recruitment activity and career development programs for students and alumni both on-line at http://www.ucalgary.ca/careerservices and in person.

Programs and services at Career Services include:

- JobLink provides online access to full-time, summer, part-time and co-op and internship positions, on-line interview sign-up, company profiles, an event calendar and more.
- Peer advisors and resume and cover letter review are available by appointment, at drop-in sessions, or online with ResumeOptimal.
- Meet potential employers at career fairs, information sessions, and networking events. Event listings and on-line sign-up are found on JobLink.
- Online workshops and resources provide career and job search information.
- Dedicated faculty specific advisors and the Will it WRK 4U? Series industry panels help students define career options within specific areas of study.
- The Career Education Program (CEP) provides students with the knowledge, tools and confidence to successfully manage all aspects of job search and allows them to add credits to their Co-Curricular Record.
- Administration and information about Co-operative education and Internship programs.

Employer’s peak hiring times are in September, October and January through March.

Telephone: 403.220.8020
Fax: 403.282.8342 or 403.284.1755
Recruiting: recruit@ucalgary.ca
Co-operative Education and Internship: coop@ucalgary.ca
Location: MacEwan Student Centre 188
Website: http://www.ucalgary.ca/careers
Centre for International Students and Study Abroad (CISSA)

Director (International Relations): Glynn Hunter, BA, MA

The Centre for International Students & Study Abroad (CISSA) provides support to international students related to their adjustment to the university and Canada, and promotes an understanding of international issues among Canadians by involving them in programs (study abroad, work and volunteer overseas), which develop a global experience.

Programs and services at CISSA include:
- Study/work/volunteer abroad resource library
- Selection and administration for Student Exchange Programs and Group Study Programs (semester, Spring and Summer)
- International student advising and support
- Bridging programs (bringing Canadians and international students together): Global Friends, Language Bank
- Volunteer opportunities in CISSA and referral to other organizations in Canada and abroad
- Handbooks for international students and study abroad students
- Arrival orientations and workshops for new international students and a term long Mentorship/Buddy Program to assist new students
- Workshops to prepare U of C students going abroad and returning home: Risk and Safety; Academic Issues, Culture Differences and Culture Shock, and Reentry - Coming Home.

Telephone: 403.220.5581
Fax: 403.289.4409
Email: cissa@ucalgary.ca
Location: MacEwan Student Centre 275
Website: http://www.ucalgary.ca/uci/

Disability Resource Centre

Director: Johanne Tottle PhD

- Advising and support for students seeking academic accommodations
- Arranging assistive services such as learning strategists, note-takers, and sign language interpreters
- Guidance and information regarding student funding
- Referrals to on-campus services and community/government agencies
- Access to a variety of adaptive technologies such as a voice-recognition and speech synthesis
- Accommodated exam support

Telephone: 403.220.8237
Fax: 403.210.1063
Email: jusmith@ucalgary.ca
TTY: 403.220.2823
Location: MacEwan Student Centre 293
Website: http://www.ucalgary.ca/drc

Enrolment Services

Enrolment Services assists students in carrying out a variety of administrative functions at the University of Calgary. Enrolment Services provides front-line services and phone student support services in the following areas: prospective student inquiry, admissions, students awards and scholarships, course registration support, financial aid and student fees. Enrolment Service Advisors are available to support and assist students with questions.

Enrolment Service Advisors can be accessed as follows:

By Telephone: 1.403.210.ROCK (7625)*

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

In-person Service:
- Transcript orders and printing on demand (online service)
- Proof of Enrolment forms completed for undergraduate students (online service)
- Fee payments, undergraduate assessment and account inquiries
- Student loan inquiries, signing and completion of Interest Free forms
- Undergraduate registration support and referral
- Undergraduate adding/dropping/withdrawal from courses
- Undergraduate award/scholarship support/assistance and general inquiries
- Prospective student inquiries

Online services are available 24 hours a day, 7 days a week via myUofC online Student Center:
- Transcript Request, by mail and/or courier
- Add/drop/edit/swap courses
- Update personal information
- Print T2020A tax receipts (available online only)
- Print Proof of Enrolment letters (not for government student loans)
- Change of program and Letter of permission requests
- Tuition and Fees assessment, view account details, and due dates

Contact Information:
Telephone: 1.403.210.ROCK (7625)
Fax: 1.403.289.1253
Location: MacKinnie Library Block 117
Website: http://www.ucalgary.ca/registrar

Hours of Operation: Monday to Friday - 09:30-16:30, and Thursday - 10:00 - 16:30
*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: http://www.ucalgary.ca/currentstudents/serviceinformation.

The Native Centre

Director: Shawna Cunningham, B.A., M.A.

The primary mandate of The Native Centre is to provide a culturally appropriate learning environment that encourages and supports the success of Aboriginal students in their pursuit of knowledge and higher education at the University of Calgary. The Native Centre provides academic, personal, and cultural support services and programs to prospective and current Aboriginal Students, and is a welcome and supportive learning environment for the whole campus community.

Services:
- Pre-admissions advising
- Program advising for Open Studies students
- Advocacy for academic and non-academic student issues
- Information and referrals to campus-wide services
- Advising and advocacy for Aboriginal student funding
- Peer tutoring and remedial support
- Retention workshops
- Cultural and spiritual advising

Programs:
- NAPI Ambassador Aboriginal Youth Outreach Program
- LYNX: Aboriginal Student Career and Employment Program
- Peer Assistant for Student Services (PASS Social Events Program)
- Student Volunteer Opportunities
- Aboriginal Student Access Program (ASAP)
- Old Sun Community College Academic Outreach Program

Events:
- Pipe Ceremonies
- Women’s Tea Ceremonies
- Red Lodge Speakers Series
- Potlucks
- Recreational Field Trips and Social Events
- TNC Annual Graduation Banquet and Pow-wow
- First Nations Student Association’s Annual Native Awareness Days

Facilities:
- The Red Lodge, Student Lounge
- First Nations Student Association Offices
- Computer Lab
- Study Space

For more information, please contact us at:

Telephone: 403.220.6034
Fax: 403.220.6019
Location Room 3902 MacEwan Student Centre
Website: www.ucalgary.ca/nc
Residence Services
Director: Randy Maus
Residence at the University of Calgary is designed to help students connect to one another in a community where people matter. It provides easier access to campus resources and opportunities, and support for students academically as they work toward their degree. Residence is open to all full-time students, and includes accommodations that meet a variety of needs from first year to graduate to students with families. To apply or find out more about the residence experience, facilities and services, please explore our website http://www.ucalgary.ca/residence.

Single Student Housing
Single student housing is located on the southwest corner of the University Campus. It consists of ten buildings offering a variety of accommodations styles from traditional residence to suites and apartments. Rundle and Kananaskis Halls are newly renovated traditional style residences accommodating approximately 720 students in double and single rooms (Please note there are a limited number of single rooms available). Housing consists of single gender and co-ed wings or floors to best meet the needs of individual students. Laundry facilities, recreational lounges and academic lounges are all available for student use. To ease the transition to university students living in these buildings are automatically enrolled in a meal plan. More information on meal plans can be found at http://www.dineoncampus.uofcalgary.ca.

Cascade Hall, Norquay Hall, Brewster Hall and Olympus Hall accommodate upper year undergraduate students in furnished, studio, one bedroom (single occupancy), two bedroom and four bedroom apartments.

Glacier Hall and Castle Hall are designated as graduate student apartment style buildings with the same services as our undergraduate buildings.

Yamnuska Hall, the newest residence on campus opening for students Fall 2011, is composed of two and three bedroom suites. It is a wonderful hybrid style of living that offers a strong sense of community and privacy. Students in Yamnuska Hall are also automatically enrolled in a meal plan.

Two living learning communities are also available. Global Village houses 125 students (50% international, 50% Canadian) in suite style rooms and is focused on multi-cultural, global, and local awareness as well as leadership in a multicultural community. The Scholars’ Advantage floor is focused on academic success and excellence and available to students accepted under the SUCCESS Program.

Each building has a highly trained staff of Community Advisors and Residence Life Coordinators that is available 24 hours a day to assist students with the challenges faced in university. They are specifically trained in responding to personal crisis, directing students to appropriate university resources, academic learning strategies, and community building. In addition, each building also has its own academic lounge and recreational lounge.

Students who have specific accessibility, mobility or medical needs are asked to indicate these needs on their application. Residence Services will work with students to meet their specific needs where possible. Students must apply online at http://www.ucalgary.ca/residence. First-Year Undergraduate Students are guaranteed a space in residence if their application is received prior to April 30 of each year. All other new students are encouraged to apply as soon as possible, as demand for residence is high, and student housing assignments are completed on a first-come, first-served basis. Returning students have first priority for choosing residence in their next year. Applications are available each year in November for first year students and December for all other students.

Multi-Year Housing Guarantee
The university is excited to guarantee all first-year students who live in residence a home in residence in their second year of study at the University of Calgary. Telephone: 403.220.3210
Email: residence@ucalgary.ca
Location: Dining Centre 018
Website: http://www.ucalgary.ca/residence

Student Family Housing
Student Family Housing consists of 250 townhouses, arranged in a garden court setting that is ideal for students with families. In addition to the facilities offered, Residence Education Staff facilitate programs and services to meet all family members’ needs, including community barbecues, summer camps, ESL conversation groups, and the Jenna Chang Children’s Resource Library. Space is limited in Student Family Housing, and the waitlist is processed based on date of application. To apply online or to learn more about student family housing, please visit our website.
Telephone: 403.220.7227
Location: 3735 - 32 Avenue N.W., Calgary, Alberta T3B 2X1
Website: http://www.ucalgary.ca/residence

Student Awards Office
Director: Claudia Barrett
The Student Awards Office provides undergraduate scholarships, bursaries and awards information to entering and continuing students, linking them with valuable financial resources for their post-secondary studies. Award competitions for entering or continuing undergraduate students at the University of Calgary are listed below:

Admission Scholarships:
- President’s Admission Scholarships
- University of Calgary Entrance Scholarship
- IB Diploma Scholarships
- AP+ Scholarships
- High School Awards:
- Chancellor’s Club Scholarships
- Seymour Schulich Academic Excellence Scholarships
- Seymour Schulich Community Service/Entrepreneurial Awards
- High School Awards
- Transfer Awards
- Continuing Undergraduate Awards
- Faculty of Law Awards
- Faculty of Medicine Awards
- Medical Elective Awards
- Faculty of Veterinary Medicine Awards
- Athletic Awards
- Convocation Awards for Graduating Undergraduate Students
- Alberta Scholarship Programs: Louise McKinnon Scholarships, Jimmie Condon Athletic Scholarships, Jason Lang Scholarships, Laurence Decore Scholarships, Lois Hole Humanities and Social Sciences Scholarship, Dr. Gary McPherson Scholarships
- For further information on financial aid for undergraduate students, refer to the Awards and Financial Assistance section of this Calendar.

Location: MacKinnie Library Block 124
Telephone: 403.210.7625
Fax: 403.282.9999
Questions: http://www.ucalgary.ca/currentstudents/asktherock/
Website: http://www.ucalgary.ca/studentfinance/

The Student Success Centre
Director: Joel Wilkinson
The Student Success Centre is here to support you in your personal, academic, and career success. From when you first arrive at the University of Calgary through to when you graduate, we provide services and programs to ensure you make the most of your time here at the U of C. These programs and services are available to ALL undergraduate and graduate students including:

- Program Advising for students from the Faculties of Arts or Science including assistance with managing your program degree requirements, assistance with using Degree Navigator, checking your GPA and academic standings and other related questions.
- Academic Advising offers a personal connection with students to help them develop an educational plan and guide them throughout their university career; ultimately resulting in the realization of their career goals.
- Writing Support tutors are available by appointment for all students wanting to learn strategies to write more effectively and gain a better understanding of how to improve their written assignments. Writing workshops are also held in the fall and winter semesters.
Student Services

- Leadership Programs are offered by way of the University of Calgary Leadership Program (UCL) providing training in personal, team and community leadership and the Emerging Leaders Program designed for first-year students.
- Student Success Workshops are offered throughout the fall and winter semesters covering a variety of topics to help support your academic success.
- Career Planning and Coaching Services are available for both undergraduate and graduate students through personal one-on-one planning/coaching sessions with our Career Development Specialists and informative workshops on relevant topics are also available.
- Orientation and First Year Experience Programs help to ease the transition for new students to the U of C and sets you on the right path.

Telephone: 403.220.5881
Fax: 403.220.0190
Location: Taylor Family Digital Library, 3rd Floor
Website: http://www.ucalgary.ca/ssc

Scholars Academy Program
ACE: Academics, Community, and Engagement

In response to the University of Calgary’s commitment to undergraduate research, scholarship, and leadership, the Scholars Academy Program strives to enhance the academic and professional development of outstanding undergraduate students. As a main objective, students are admitted to the Scholars Academy Program to work with a dedicated academic development specialist who provides academic and scholarship support, promotes community commitments, and encourages student engagement (ACE).

Admission to the Scholars Academy Program requires students to be at the top of their class academically. Students are also chosen based on a demonstrated ability to make the most of offered opportunities and the ability to create opportunities where none exist.

Students from all faculties are welcome to apply.

For more information, please contact the Scholars Academy Program Coordinator:
Veronique Ram
Email: vram@ucalgary.ca
Telephone: 403.220.2696
Website: www.ucalgary.ca/sap

SU Wellness Centre
SU Wellness Centre Director: Debbie Bruckner
The SU Wellness Centre is the collaboration of Student Health, Counselling Services and Chaplaincy to provide wellness in mind, body and spirit to support academic and personal success. Integration has created a culture of wellness on campus – a place where students can truly experience an opportunity to grow in health and wellbeing through partnership with Wellness Centre professionals.

Counselling Centre
Programs and services at the Counselling Centre include:
- Individual and couples counselling provided by registered psychologists and counsellors-in-training
- Workshops including managing time, stress and sleep; managing test anxiety; overcoming procrastination; making educational, personal wellness and career decisions
- Career Clinic, drop-in times to assist with your educational and career decisions
- Academic Clinic, appointment bookings to assist you with educational success strategies
- Counsellor Training Program for provisionally registered psychologists and graduate level practicum placements
- Website information including FAQ’s, tip sheets and useful links to personal, academic and career information

Telephone: 403.210.9355(WELL #1 for Counselling
Fax: 403.284.0069
Location: MacEwan Student Centre 370
Website: http://www.ucalgary.ca/counselling/ and http://www.ucalgary.ca/wellnessguide

The Multi-Faith Chaplains’ Centre
The Multi-Faith Chaplains’ Centre consists of several Chaplains from various faith/religious traditions (Catholic, Protestant, Jewish, Buddhist, Muslim). We offer spiritual and faith based programs, events and support to students, staff and faculty on campus. The Centre operates under four guiding principles: connecting, learning, serving, and practicing.

We offer a variety of services that are open to all:
- Drop-in Centre
- Meditation and Prayer Rooms
- Multi-Faith support, guidance and worship services
- Community/Social events
- Lunch and Learns
- Spiritual and Social Justice programs
- Crisis support

Telephone: 403.220.5451
Location: MacEwan Student Centre 373
Website: http://www.ucalgary.ca/chaplain

Women’s Resource Centre
The Women’s Resource Centre provides a safe and supportive place to advance women’s equality and build community where all experiences are valued, and everyone is offered the resources necessary to make informed choices. The WRC strives to create a more inclusive campus environment where each individual’s agency and voice are nurtured to contribute to the collective spirit of a community where citizenship and leadership is made possible for all, regardless of gender. We celebrate diversity based on – but not limited to – gender, ethnicity, race, class, ability age and sexual orientation and we believe that the key to achieving empowerment is through the cycle of reflection and action, creating positive social change. The WRC uses three pillars of work to achieve our goals: Wellness, Leadership, and Diversity.

Programs and services at the WRC include:

Student Services:
- Peer Support (peer to peer counseling on a diversity of issues)
- Meaningful volunteer opportunities, training and recognition
- Training and certificates in Leadership, Wellness and Diversity
- Workshops (health and wellness, global and cultural issues, etc.)
- Online Resource Database (with hundreds of resources accessible through the WRC website)
- Social Gatherings (knitting circles, craft groups, movie nights – all free of charge)
- The WRC Awards - To celebrate women’s Wisdom, Resilience and Compassion by identifying and honouring an alumna and a female University of Calgary student
- Special Events - December 6th Memorial: National Day of Remembrance and Action on Violence Against Women, International Women’s Day Celebration
Facilities:
- Lounge
- Study Space
- Resource Library
- Club and group meeting space
- Quiet meeting space for women experiencing challenging situations

Telephone: 403.220.8551
Fax: 403.210.7970
Email: women@ucalgary.ca
Location: MacEwan Hall 318
Website: http://www.ucalgary.ca/women/
Hours: Monday to Friday, 8:30am – 4:30pm

Bookstore
The main Bookstore is located centrally on campus, on the ground floor of the MacEwan Student Centre. We offer required and recommended textbooks for courses at the publisher’s list price and make every effort to obtain the least expensive options for students. We also provide a used textbook buyback service, a free online classified service, and a buyback alert service. In our digital world, books can be located from a variety of sources, however your campus Bookstore offers the advantage of having exactly the books you need, in stock for the beginning of classes, all with a hassle-free returns policy. Digital or e-books can be a great option for some students. Benefits can include portability, continual updates, and additional tools that help you highlight, search, or take notes. As more textbook titles become available, the University of Calgary Bookstore will carry both choices. Some of the textbooks we carry can be rented instead of purchased. You can rent your textbooks online and have them quickly delivered right to your door for a fraction of the cost of purchasing them new. Students typically save 50% off of the new book retail price by renting.

We are more than just textbooks! The main Bookstore carries one of Calgary’s largest selections of general reading books, and we can special order any book still in print. We are also pleased to offer University of Calgary clothing and souvenirs, Dinos merchandise, and a wide selection of stationery and art supplies. The Bookstore has a secure online store that features the required and recommended textbook list each semester, online ordering for textbooks, clothing, gifts, and select general reading titles. Order your textbooks online, with the option of in store pick-up or delivery and avoid the back-to-school rush! Check out our site at http://www.calgarybookstore.ca/.

Special extended hours apply during back-to-school periods, during the summer months (May through August), so please call or check our website for the most current information.
Telephone: 403.220.5937
Toll free: 1.877.220.5937
E-mail: bkstore@ucalgary.ca
Website: http://www.calgarybookstore.ca/

Campus Recreation
As a University of Calgary Student, you are automatically an ‘all-access’ member of Calgary’s largest and most complete recreation facility. You pay for this membership with a fee that is assessed with your tuition. Students can also purchase family memberships at special student rates.

You can find complete, detailed information about our facilities and programs (including intramural sports and open recreation time) online at www.ucalgaryrecreation.ca, or by calling 403.220.6942 (24 hours). Look for program guides from our Health and Recreation programs unit, Intramural Sports and Sports Clubs and Outdoor Centre in display racks located around campus.

Facilities:
Our giant Fitness Centre features free weights, weight machines, cardio equipment, a Super Circuit and a six lane, 200 meter indoor track. Certified staff are available for fitness appraisals, fitness and nutrition counseling, and customized programs.

We have the largest Racquet Centre in Calgary with squash, racquetball, badminton and tennis courts. Students pay no court fees.

Our Aquatic Centre boasts an Olympic sized pool. Aquatic instruction and certification is available for adults, children and youth. The Aquatic Centre hires new lifeguards on a regular basis.

The Outdoor Centre offers equipment rental and a fantastic range of outdoor recreational and instructional programs for summer and winter activities. The “OC” also features a giant, indoor climbing wall, specifically designed for climbing instruction.

Programs:
Participate in a number of fun team sports with our Intramural Sports program. You can register as part of a team or as an individual. Most sports are offered at both competitive and recreational levels, allowing all skill levels the ability to participate and compete.

The Campus Recreation Sport Club program provides opportunities for instruction, competition, and fun, with a variety of activities for all levels of skill.

The Health and Recreation Centre offers a wide variety of programs from health and wellness, to recreation programs and certifications. Instruction is offered in fitness, first aid and CPR, pre-hospital care, skating, swimming, court sports and many more. If you have children, we offer gymnastics, swimming, skating, court sports, outdoor activities and Karate programs for all ages from pre-school to teens. We are also one of Calgary’s largest summer camp providers with a huge range of camps for every kind of kid or teen.

Telephone: 403.220.7749
Website: http://www.ucalgaryrecreation.ca
Location: Kinesiology Complex

Centre for Community-Engaged Learning
The Centre for Community-Engaged Learning offers programs and services to support the institutionalization of service-learning and civic engagement and to link the university to the greater community. Our programs seek to enhance the student experience in and out of the classroom. The Centre’s services include:
- Support to faculty developing service-learning courses
- A place of contact for community organizations
- Curricular service-learning programs including Calgary Serves Canada, an ‘alternative’ Reading Week project
- Local, short-term service projects
- Projects and campaigns on food security
- International service-learning programs
- Events to foster enhanced civic consciousness
- Peer Helper positions and a Peer Helper workspace

Telephone: 403.210.6509
Fax: 403.210.7970
Location: MacEwan Student Centre, 4th Floor
Website: http://www.ucalgary.ca/CCEL

Food Services
Senior Director: John Duncan
The University of Calgary’s Food Services operated by Chartwells Education Dining Services is dedicated to providing excellent retail, dining plan and catering services to the campus community. Students, faculty and staff are able to purchase meal options that make it easier to eat on campus and focus on their studies and work.

Food Services operates 20 retail food operations in 9 different buildings on campus. The Alberta Room in the Dining Centre offers the greatest choice of any operation and is available to the entire campus community. Each operation is distinct in menu offerings, operating hours, service style and atmosphere. The Dining Plan Program offers convenience and flexibility to students at any of our operations through use of the ONE card. Impressions Catering is available to provide any type of catering service required. Sit down service is also available in the new Bistro Alma.

Telephone: 403.220.5541
E-mail: food.services@ucalgary.ca
Location: Dining Centre 110
Website: http://www.ucalgary.ca/foodservices/
Healthy U of C

Health and Wellness is a key focus of the University of Calgary Human Resources’ People Strategy; it contributes to the University’s goal of being an employer that successfully attracts and retains valued staff. A commitment to organizational and individual health and wellness will lead to a supportive environment where faculty and staff feel valued and are proud of their achievements and their contributions to the University’s organizational goals. The University of Calgary promotes a healthy learning and work environment for students and University staff members. We offer services and facilities that will help you with your physical, social and mental well-being. When you feel well, you are more resilient and better able to do your best in your studies, work and life.

Healthy U of C coordinates health promotion events throughout the year. Information can be found at http://www.ucalgary.ca/HealthyUofC.

The Wellness Guide is an online resource for students with everything you need to know about academic success, and emotional, spiritual, physical and social stuff. Visit http://www.ucalgary.ca/wellnessguide.

2008 saw the formal launch of a new Wellness Centre and the integration of Health Services (family physicians, chiropractors, massage therapists, nutritionists, psychiatrists), Counselling and the Chaplaincy. Integration will create a culture of wellness on campus - a place where students can truly experience a commitment to improving health and wellbeing.

Smoking Reduction Policy

With its Smoking Reduction Policy, the University strives to provide a safe and healthy work, learning and living environment for all staff, faculty, students and visitors. As a champion of health and wellness, the University believes that a reduction in smoking on campus is beneficial to all. Smoking is not permitted indoors nor within five metres of building entrances and air intake vents. As of January 1, 2009, tobacco product sales have been prohibited on campus in compliance with provincial legislation, the Alberta Tobacco Reduction Act. Please respect everyone’s right to clean air and a healthy environment. See the Smoking Reduction Policy at the following website for details: https://pr1web.ucalgary.ca/UofC-PandPA_R1/Forms/MainHome.aspx.

Scent-Free Initiatives

The Scent Free Awareness Campaign "We Share the Air" asks for your support in limiting or eliminating the use of scented personal care products whenever possible. Please see the website http://www.ucalgary.ca/scentfree for information about the health effects related to scented personal care products and alternatives that you can choose.

Thank you for helping make the University of Calgary campus a healthy environment for everyone.

The University of Calgary was honored to receive the Calgary Chamber of Commerce Gold Level HEA.T. (Helping Employees Achieve LifeTime health) award in 2005 for our workplace health initiatives. We believe that the quality of our workplace influences the quality of student experience.

The University of Calgary is the proud recipient of the Premier’s Award for Healthy Workplaces (2006), and received the highest accolade as the recipient of the Award of Distinction for employers with greater than 1000 employees. This award recognizes Alberta employers who demonstrate commitment to improving the health of employees and provide healthy workplace programs that encourage employees to make healthy eating choices and live an active lifestyle to remain healthy at work and beyond.

Healthy U of C recognizes that health and wellness is a shared responsibility between the organization and its people. Health, Safety and Wellness is one of the thirteen portfolios in the Campus Sustainability Plan, and the Sustainability Stewardship Working Group is an interdisciplinary team coordinating initiatives designed to actively engage the campus community in promoting a healthy campus culture. The portfolio’s mission is to further understand the interrelationships between quality of life and sustainability, and seek local and global solutions; to enhance awareness of the interrelationships between the built environment, health, and wellness; and to enhance the quality of life on campus and in the community at large. As a post-secondary institution, we have a special responsibility to create a healthy community that enhances the student experience and models healthy choices.

Use of Alcohol Policy

The Use of Alcohol policy deals with the consumption of alcoholic beverages on the campus and its 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 http://www.ucalgary.ca/UofC/departments/Risk/riskmgmt/).

ID Card Office (Campus ONECard)

The Campus ONECard gives members of the University community (faculty, staff, and registered students) access to a wide variety of information services and technologies. Cardholders who are not part of the academic community may also be entitled to some of these privileges. The Campus ONECard is an identification card and can also serve as a library card, campus recreation membership card, electronic door access card and debit card (for food, photocopying and laser printer copies).

The Campus ONECard is issued by the ID Card Office /Campus Security, located in MacEwan Student Centre, Room 260. The office is open Monday to Friday 08:30-16:30 with extended hours (until 18:00) at the beginning of the fall and winter terms. Please check this web site for extended hours of operation: www.ucalgary.ca/security.

To report a lost or stolen card please phone 403.220.7290.

All financial/debit functions of the Campus ONECard are handled by the Campus Card Office, located in the Dining Centre, Room 01, telephone: 403.220.4922.

For more information on these services please check this website: http://www.ucalgary.ca/campuscard/.

Information Technologies

University of Calgary Information Technologies (UCIT) is responsible for providing computing and networking support to U of C students via PC computers, Unix, and high-performance computing facilities. Every student is entitled to a UCIT computing account on the central computing system. More information on getting an account and the benefits of an UCIT account can be found at: http://www.ucalgary.ca/it/itaccount.

As a student, you may use UCIT-supported PC and Unix workstation services across campus. Particularly important is the Information Commons on the second floor of the MacKinnie Library Block, where you will find over 250 PCs, printing facilities (including printing from wireless) and access to AirUC (U of C’s wireless network). In addition to the IC, the Elbow Room (Room 142 Science Theatres) offers a "drop-in" microcomputer lab with UCIT staff available to offer technical assistance. For more information, please see http://www.ucalgary.ca/itlab.

Additional networking services include: AirUC, the U of C Wireless Network, available throughout the campus. For more information about wireless service please go to http://www.ucalgary.ca/it/wireless; and RezNet - U of C’s high-speed network for students living on campus. Browse the web, check your email, work online from almost anywhere in your campus home. For more information, please see http://www.ucalgary.ca/reznet/.

UCIT supports many academic applications including Blackboard, Elluminate, Breeze, database management, graphics, printing and email, Web tools, statistical analysis, simulation, a comprehensive range of programming languages and scientific applications, and text processing. Documentation, consulting, and non-credit courses on software and hardware are also available.

UCITs Com/Media unit provides audio-visual, portable computing and other communications media support for teaching and learning activities. A wide range of educational media technology is available by contacting any of the Com/Media cross-campus booking and service centres. Equipment is
then scheduled, delivered, set-up and made ready for the class. See http://www.ucalgary.ca/commedia for more information.

UCIT also co-ordinates site-license agreements and volume discounts for specialized software. For more information, go to http://www.ucalgary.ca/it/software. UCIT distributes site-licensed anti-virus software for detecting, removing and preventing computer viruses. Go to http://www.ucalgary.ca/it/virus for more information or a free download.

Get help from: IT Support Centre: 403.220.5555
Email: itsupport@ucalgary.ca
Location: Mathematical Sciences Building, 7th Floor
For more information on all Information Technology Services go to: www.ucalgary.ca/it/services.

Dinos Athletics (The Interuniversity Athletic Program)
A big part of your University of Calgary experience is Dinos Athletics. There is no better way to feel the proud 45 year history of our school than to join your fellow students in the stands, cheering the Dinos to victory. With a mission of lifting the spirit and pride of all members of the University community, Dinos Athletics belongs to everyone and we encourage you to enjoy the experience.

Dinos Athletics is a full member of the Canada West University Athletic Association, Canada West is the most competitive conference 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.

Professional coaches and world-class equipment, facilities and support services are provided for the interuniversity athletic program. Students will find interuniversity athletics challenging and exciting as participants, and interesting and entertaining as spectators.

Don’t forget, all undergraduate and graduate students are admitted free of charge to all conference games upon presentation of proper I.D.

For further information contact:
Dinos Athletics - Faculty of Kinesiology
Kinesiology Complex A 147
Telephone: 403.220.6803
E-mail: goDinos@ucalgary.ca
Website: http://www.goDinos.com

Parking and Transportation Services
The university has approximately 8,800 parking stalls on campus. A flat rate per entry applies most days and evenings. Hourly parking is also available for short-term visitors. Arrangements can be made to purchase a lot assignment by the year or term. In addition to the on campus facilities, parking capacity for some 700 cars is available just south of the campus at McMahon Stadium.

Further information and applications for parking assignments can be obtained from Parking Services. Lot locations and costs can be found on the Parking Services website.

Before you consider driving to campus, check out our sustainable options at http://www.ucalgary.ca/parking.

Telephone: 403.220.6771 or 403.220.6772
Email: parking@ucalgary.ca
Location: Olympic Volunteer Centre (OVC), North end of McMahon Stadium
Hours of operation: 07:30 - 17:00 Monday to Friday
Website: http://www.ucalgary.ca/parking

Student Legal Assistance (SLA)
Director: Maureen Mallett
Run by law students, Student Legal Assistance (SLA) is a registered charity that delivers a range of free legal assistance and representation to undergraduate students at the University of Calgary, as well as those in the Calgary area who are unable to afford a lawyer. SLA operates a legal clinic on the University campus four evenings per week during the school year, and on a full-time basis throughout the summer months.

SLA can assist in most matters at the Provincial Court of Alberta, as well as some Administrative Tribunals. Most common areas SLA assists with include:

- Student appeals (academic and non-academic)
- Landlord tenant issues
- Employer disputes
- Traffic violations
- Bylaw infractions
- Criminal law
- Contract issues
- Family matters

For appointments call: 403.220.6637
Fax: 403.282.0473
Location: Murray Fraser Hall 3390

The Students’ Union
All undergraduate students at the U of C are members of the SU, providing access to a wide range of academic supports, social events and opportunities to make the university experience one of the most exciting times of your life.

The Students Union is comprised of elected student leaders, a 23-member Students’ Legislative Council (SLC) and is supported by a professional staff and hundreds of volunteers. With the MacEwan Student Centre as its home, the SU serves students by advocating on academic matters and providing a broad range of services, products, programs and events that can enhance the quality of your educational experience and the quality of student life on campus. The SU is also the voice of students and advocates for the student community on an affordable and accessible post-secondary education experience.

Quality of Education
A key focus of the SU is to advance and evolve programs, services and events that enhance the quality of education for undergraduate students through awareness, involvement and advocacy. Through participation in the development of university academic plans, participation in national dialogues on the cost of academic materials for students, promoting student feedback through national and university student surveys and nominating instructors for teaching excellence, the SU ensures that the UoC student voice is heard on matters of academic importance. The SU offers a range of academic programs and services such as the Bookloan Program for students in financial need, the Online Exam Bank, locker services, book consignment and printing services and annually supports the addition of new library resources for students. To promote undergraduate research, the SU holds the annual Undergraduate Research Symposium and offers a range of academic awards to support students that face unique financial challenges while attending school or those that excel in leadership or their academic programming. The SU also provides travel and conference funding to enable students to attend conferences or competitions related to their field of study.

Quality of Student Life
The Student’s Union believes that the student experience at the UoC involves more than just the classroom. The SU is dedicated to providing a wide range of health and lifestyle programs, products, services, facilities and events to ensure that all the supports and choices are in place to create an excellent student lifestyle. The SU supports 245 student clubs - opportunities for students to get involved in athletics, music, theatre, social issues, volunteering, religion, cultural issues, politics and academics, quite literally something for everyone. And a range of annual, weekly and special events throughout the year - the line-up including major activities and celebrations like Orientation Week, Nogfest, Holiday Hangover and Bermuda Shorts Day (BSD), weekly activities like Cinemania and Yoga in That Empty Space, entertainment and concerts and special events like Cultural Month and Wellness Month. The SU provides undergraduate student health and dental care plans and lifestyle services including an off-campus housing website, the newly opened Q Centre for our lesbian,
Student Services

gay, bisexual, transgendered and queer community and annual support to campus Safewalk and the Wellness Centre. The SU has been a campus leader in promoting awareness and actions on sustainability. The SU Sustainability Board is established to influence and effect environmentally sound and socially ethical decisions on campus and to offer opportunities through the Sustainability Grant Fund for students to act on their own ideas. The major Quality Money program, a partnership with the University Board of Governors, annually invites students to create their own legacy at the UoF by proposing projects that would enhance the student experience on campus. The SU provides a range of volunteer service opportunities both on campus serving fellow students and out in the “real world” serving the community. Students can get practical hospitality experience through the SU Information Centre and Lost and Found, professional office experience, tax preparation experience or organizational experience at the Campus Food Bank by volunteering for the SU. And the SU is in business to fund its efforts and keep student fees and levies low. In addition to the book, print and inexpensive photocopying services of Bound & Copied, the SU owns and runs Stor, the MacEwan Conference and Event Centre, The Den and Black Lounge and Mac Hall and Ballroom. As operational manager of the Student Centre, the SU has facilitated a number of retail and other services through tenant agreements to support undergraduate student lifestyle, including the busy food court.

Affordability and Accessibility
As the student advocate on affordability and accessibility of postsecondary education, the SU lobbies the university on the cost of tuition; local government on safe and affordable housing and transit costs; and the federal and provincial governments on such matters as the regulation of non-instructional fees, student loans and financial support to the UoF. The SU Executive represent student interests on a range of University boards, steering committees and task forces on academic and student life issues, including the highest governing body, the University Board of Governors, and the University Senate.

Partnerships
One of the SU’s primary objectives is to build and sustain positive and proactive working relationships with University administration and the Board of Governors on matters of mutual interest and importance. While one of the SU’s role directions is advocacy with the university to ensure student interests are represented in university decisions, there is an equally important role in working in partnership and ensuring mutual support of events and activities that benefit undergraduate students. The SU is engaged in event coordination and provides a range of financial, facility space and communications support to events of mutual interest and benefit. Take pride in your University and get the most out of your experience!

To become involved or benefit from what your SU offers, visit the SU website at: www.su.ucalgary.ca.

Location: Students’ Union Office 251 MacEwan Student Centre
Telephone: 403.220.6551
Email: studun@ucalgary.ca

University Child Care Centre Society (UCCC)

Our mandate is to provide and promote childcare services for the children of students, faculty and staff that make up the University of Calgary Community.

At the UCCC we believe that play is imperative during the early years of life. Our goal is to provide an exemplary inclusive program that supports and encourages the unique potential within each child. We do this by promoting the natural process of play in an enriched setting that provides optimal conditions for each child to grow at their own pace.

The Centre is open from 7:30 am to 5:30 pm Monday through Friday. We are closed on all statutory holidays, two professional days per year as well as the week between Christmas and New Year.

Admission to UCCC Society

Applicants are prioritized within each age group on the basis of their waiting list application date. At our Main Campus location the order of priority placement is first given to University of Calgary full time students followed by University of Calgary faculty and staff, with the exception of children who have a sibling attending the UCCC Society, in which case sibling placement takes priority. At our West Campus location, staff and faculty have priority over full time students.

For more information:
Telephone: 403.220.7789
Email: wconline@ucalgary.ca
Tutoring Location: MacEwan Student Centre, 4th Floor
Website: http://www.ucalgary.ca/writingsupport/

University Library

See Libraries and Cultural Resources in About the University of Calgary.

Writing Support Services

Writing Support Services offers free half-hour individual writing tutorials for students at all levels who want to improve their writing. In a tutorial, students can

• Discuss their writing process and learn strategies to write more effectively
• Review returned papers to understand how to improve their written assignment
• Work with an instructor on an ongoing basis to improve essay structure, para-

graph development, sentence structure and style, grammar, and punctuation

• Receive information on writing papers, book reviews, or other assignments
• Get advice on how to use and document sources
• Get help with English as a Second Language

Writing Support Services instructors will give general advice on papers being prepared for credit courses; however, they will not proofread student papers.

To book a half-hour appointment, please visit http://www.ucalgary.ca/writingsupport/. For Writing Support help via email, write to wconline@ucalgary.ca, describing your writing assignment, questions, and concerns in detail.

Telephone: 403.220.7789
Email: wconline@ucalgary.ca
Tutoring Location: MacEwan Student Centre, 4th Floor
Website: http://www.ucalgary.ca/writingsupport/

Get advice on how to use and document sources

Get information on writing papers, book reviews, or other assignments
About the University of Calgary

The University of Calgary is a comprehensive research university that, in its short 45-year history, has grown to take its place among the finest institutions in Canada. Combining the best of long-established university traditions with the City of Calgary’s vibrant energy and diversity, the university aims to provide a research and scholarly foundation for students eager to acquire the knowledge and skills essential for a successful personal and professional life.

Our 213-hectare campus provides a beautiful and dynamic setting for our scholars and students. The University of Calgary has 14 faculties with more than 60 departments and over 30 research institutes and centres. The 14 faculties are: Arts; Education; Environmental Design; Graduate Studies; Haskayne School of Business; Kinesiology; Law; Medicine; Nursing (Calgary), Nursing (Qatar); Schulich School of Engineering; Science; Social Work; and Veterinary Medicine. Our 2,761 academic staff are actively engaged in research and scholarship. More than 29,000 students, including over 1,500 international students from 100 countries, are enrolled in undergraduate, graduate and professional degree programs. The University of Calgary has more than 135,000 alumni living in 130 countries.

Research and Education

As one of Canada’s top seven research universities and a member of the 13 most research intensive universities in Canada (the G-13), 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. Thanks to the sustained efforts of University of Calgary faculty, students, postdoctoral researchers and staff, the University of Calgary’s research funding totals $262 million. 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. The university also offers students a variety of experiential, or hands on learning opportunities, including internships, international travel, coop placements and directed research.

The University of Calgary is the first university in Canada to offer a four-year graduation guarantee to students embarking upon four-year undergraduate degree programs in the faculties of Arts and Science. The guarantee program offers incoming students an agreement that ensures they will be able to graduate within four years, or the university will pay the tuition for any extra courses needed to finish. 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.

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 of Calgary is pursuing its largest capital expansion ever to add capacity for more students and a host of new teaching and learning spaces. These major developments, including the Taylor Family Digital Library, Downtown Campus, Energy, Environment and Experiential Learning building, and a new residence. The Faculty 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 Rotney 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 C 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.

http://www.ucalgary.ca/secretariat


**Coat of Arms/Logo**

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 that spirit. The logo has two components: the Coat of Arms (including the escroll with our motto) and the wordmark. The coat of arms represents and respects our historical roots while the more contemporary wordmark reflects our focus on the future and leading edge.

The Coat of Arms consists of a shield, an escroll containing the motto and the wordmark in either a horizontal (with the wordmark to the right of the crest) or vertical (with the wordmark below the crest) 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 U of C in 1966 by Lord Lyon King of Arms at Edinburgh.

**Official Colours**

The university has three official colours that appear in the Coat of Arms.

Red PMS 485; Gold PMS 116 and Black.

**Tartan**

The University has an official tartan that incorporates the U of C’s official colours of red, black and gold in its design. It was designed by Jim Odell, a U of C Education and Fine Arts graduate and accredited in a 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.

**Historical Highlights**

1905  
- Alberta becomes a province. The Alberta Normal School for training teachers is established in Calgary.

1906  
- Premier A.C. Rutherford names Edmonton as the site of the University of Alberta (U of A).

1907  
- Strathcona (now a part of Edmonton) is named as the site of the provincial university. Enraged, Calgarians conduct an unsuccessful battle to have the university relocated to Calgary.

1910  
- Calgary College is created.

1911  
- Calgary College opens its doors as a private post secondary institution. It has no degree-granting status.

1914  
- A provincial commission recommends against giving Calgary College degree-granting status.

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  
- Land in Houndsfield Heights is exchanged for the present campus site.

1951  
- 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.

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 leveling the land.

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. Carothers 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.
- Dunnies Den opens as the first pub on campus.
- Students’ Union takes over management of MacEwan Hall.

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.
- The Nickle Arts Museum opens.

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.
- The Office of Technology Transfer is established.

1985
- Calgary Hall is re-named Craigie Hall in memory of former Vice-President (Academic) Peter Craigie.

1986
- The International Centre is established.

1987
- The University acquires the land under McMahon Stadium in a trade with the city for a piece of northeast campus to expand the Light Rail Transit system.
- The footbridge spanning Crowchild Trail is relocated to the entrance of the University. It was originally designed by Engineering Professor Bob Loov.

1988
- The Winter Olympics come to campus. Murray Fraser is named President. Enrollment is frozen at approximately 16,000 full-time undergraduate students.

1989
- The University of Calgary athletic teams win five national championships. Employment Equity program is adopted.

1990
- Total outside funding for research reaches $60 million from government and private sources.

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
- The University acquires the Higher Education Reserve Lands west of Campus.
- Site dedication ceremony held for the new Rozsa Centre.

1996
- Construction of the Rozsa Centre for International Understanding and Fine Arts begins.
- Terry White is appointed U of C 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. The program aims to help students make the most out of their university experience - both inside and outside the classroom.

1998
- U of C cancer researchers receive international recognition after discovering a naturally-occurring human virus that kills cancer in mice.

1999
- Largest Information Commons of its kind in North America opens in MacKinnie Library.
- New 400-bed Cascade Hall residence welcomes students.

2000
- Science professor Alan Hildebrand is part of an international research team that tracks down and recovers meteorites in northern B.C. The meteorites are discovered to be one of the most primitive solar system materials ever found.
- International research led by U of C archaeology professor William Glanzman partially uncover a 3,000-year-old temple in Yemen that is linked with the legendary Queen of Sheba. Experts believe the temple could be as significant a discovery as the ruins of Pompeii, the Pyramids of Giza, or the Acropolis of Athens.

2001
- Dr. Harvey R. Weingarten is appointed as seventh President and Vice-Chancellor of the University of Calgary.
- Information and Communication Technology (ICT) Building opens. It features state-of-the-art teaching and Research labs. The building is strategically located between the faculties of Science and Engineering, and provides a link between the two.

2002
- President Weingarten unveils “Raising our Sights”, a four-year academic plan designed to propel the University of Calgary into the upper echelon of Canadian universities by strategically allocating resources toward four distinct areas of strength where the university can truly become an international leader.
- The Calgary Centre for Innovative Technology (CCIT) officially opens. CCIT fosters multidisciplinary initiatives through teams comprised of researchers, students and professors from such faculties as engineering, science, medicine, kinesiology collaborating with colleagues for industry, government agencies and other universities to find solutions to problems facing society and industry in several key areas.

2003
- Ground for the new Alberta Children’s Hospital was broken on the West Campus.
- The Libin Cardiovascular Institute of Alberta was 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
- Fine Arts professor Eric Cameron is awarded one of the highest honours for a Canadian artist: a Governor General’s Award in Visual and Media Arts.
- Allan Markin, chairman of Canadian Natural Resources, donates $16 million to establish an Institute for Public Health.

2005
- Seymour Schulich, a director and the largest private shareholder of Newmont Mining Corp., the largest gold mining company in the world, donates $25 million to the University’s engineering faculty, an amount matched by the provincial government. The faculty is renamed the Schulich School of Engineering in honour of the donation. Schulich’s donation creates an endowment, more than 100 new scholarships, three new research chairs, and invests in enhanced learning opportunities for students.
2006
• The university marked its 40th anniversary with a series of celebrations touching on almost every area of the campus community. One of the biggest 40th anniversary projects was the Take Your Place initiative, which saw student designers renovate 40 student spaces on campus.

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.
• The Child Development Centre officially opened on October 9, 2007. The centre will house a second child-care facility on campus and be home to a full continuum of researchers and clinicians dedicated to the study of child development-related issues. It will ultimately house other community groups with similar interests. Canada’s most advanced child development centre is also Calgary’s most environmentally advanced structure, built to Leed Platinum standards.

2008
• University of Calgary scientist Samuel Weiss, PhD, director of the Hotchkiss Brain Institute at the U of C Faculty of Medicine wins one of the world’s most prestigious medical science awards, a Gairdner International Award.
• U of C launches Canada’s fifth veterinary program in the new Faculty of Veterinary Medicine. Student involvement beyond the classroom is recognized as part of a new initiative called co-curricular record. The record is a first for Western Canadian universities.
• U of C becomes the first university in Canada to offer students guaranteed access to classes for timely graduation.
• Student involvement beyond the classroom will be recognized as part of a new initiative called co-curricular record. The record is a first for Western Canadian universities.

2009
• The university finalizes the site of its new downtown campus, which will open its doors in the fall of 2010 for students and researchers in a variety of programs.
• International House opens housing Global Village (the university’s first multicultural living-learning residence) and Hotel Alma (the university’s first on-campus hotel).
• Alumnus and celebrated Canadian astronaut Robert Thirsk, BSc’76, LL’D’09, began his 189-day mission aboard the International Space Station. While in space, he accepted an honorary degree from U of C.

2010
• A new chapter in the U of C’s 44-year history begins as Elizabeth Cannon, Dean of the Schulich School of Engineering, is officially selected as the University of Calgary’s eighth president and vice-chancellor on March 24.

2011
• In a short amount of time, construction has transformed the hole in the ground outside of MacEwan Hall into the Taylor Family Digital Library (TFDL). The first two floors of the building, including the Information Commons opened January 2011. The building is expected to be fully operational in summer 2011.

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 in one or more of the following ways:
1. By participating in a term-abroad, field school, credit travel study, or student exchange experience in another country. Students should contact their faculty or the Centre for International Students and Study Abroad (CISSA). Visit the CISSA website for more information (http://www.ucalgary.ca/UofC/students/CISSA).
2. By including in their program a Major or Minor that focuses on international, aboriginal, or multicultural issues:
   African Studies
   Anthropology
   Chinese Development Studies
   East Asian Studies
   East Asian Language Studies
   French Geography
   German
   International Indigenous Studies
   International Relations
   Italian
   Japanese
   Latin American Studies
   Russian
   South Asian Studies
   Spanish

3. By taking courses where the language of instruction is a language other than English. (Call 403.220.4000 for a list of such courses offered in French.)
4. By including several of the following courses in a degree program. Please note that some of the following courses have pre-requisites 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
   Applied Psychology 323
   Archaeology 205, 303, 305, 325, 341, 343, 345, 347, 391, 395, 357, 359, 399, 401, 409, 419, 421, 423, 427, 431, 433, 511, 553
   Architectural Studies 457
   Art History 323, 325, 357, 359, 365, 367
   Biology 307, 451
   Botany 309
   Canadian Studies 309, 311, 313, 315, 333, 351, 353, 361
   Central and East European Studies 313
   Chinese 205, 207, 229, 301, 303, 311, 313, 317, 331, 333, 355, 421, 431, 461
   Comparative Literature 203, 399, 405, 517
   Dance 574
   Development Studies 201, 375, 485, 501, 591
   East Asia 300, 500
   East Asian Studies 317, 319, 321
   Economics 321, 327, 337, 423, 425, 491, 527, 537
   English 385, 507, 511
   Film 301
   Finance 461
   German 201, 203, 301, 303, 401, 413, 525, 551
   General Studies 300, 359
   Geography 211, 213, 251, 321, 365, 367, 371, 377, 391, 397.01, 397.02, 397.03, 425, 429, 451, 463, 590, 592
   Geophysics 375
   German 200, 202, 204, 221, 223, 313, 315, 317, 331, 333, 349, 353, 357, 359, 369, 397, 401, 403, 451, 469, 497, 561, 561, 591
   Greek 201, 203, 301, 303, 401, 413, 525, 551
   Greek and Roman Studies 205, 209, 305, 315, 321, 325, 327, 355, 357, 431, 455, 457, 551
   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, 413, 525
Latin American Studies 201, 203, 301, 303, 401, 501
Linguistics 531
Management Studies 571
Marketing 467
Native Languages 205, 207
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 315, 415
Spanish 201, 203, 301, 303, 321, 323, 405, 407, 421, 423, 441, 471, 473, 475, 499, 505, 535, 555, 557, 565, 571, 581, 583, 593, 599
Strategy and Global Management 571, 573, 575
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.

Campus Services
Conference Housing is available year round; limited space is available September to April. Conference Housing offers a wide variety of accommodation from traditional dormitory rooms to apartments and hotel accommodation.

For more information please contact the Hotel & Conference Services front desk in Cascade Hall.
Telephone: 403.220.3203
E-mail: conference.housing@ucalgary.ca
Website: www.ucalgary.ca/residence

Click on Conference Housing

Visiting Scholar Suites offer assistance to those scholars visiting the campus for a limited time period and seeking accommodation on campus. There are two fully furnished apartments available year round.
Telephone: 403.220.3203
Website: www.ucalgary.ca/residence, click on Visiting Scholars Accommodations

Residence Services
Please see the Student Services section of this Calendar for further information on Residence Services for students.

Campus Security and ID Card Office

Campus Security
Campus Security is dedicated to maintaining the campus as a safe and pleasant place to live, work and study. Campus Security is responsible for the security and protection of people on campus in addition to the buildings and grounds. Close liaison is maintained with police and other security agencies in addition to City of Calgary emergency services. 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 or by dialing 403.220.5333.
Telephone: 403.220.5333
Fax: 403.282.2765
Location: MacEwan Student Centre, Room 260
Web site: http://www.ucalgary.ca/security

ID Card Office
The Campus ONEcard gives members of the University community (faculty, staff, and registered students) access to a wide variety of information services and technologies. Cardholders who are not part of the academic community may also be entitled to some of these privileges. The Campus ONEcard is an identification card and can also serve as a library card, campus recreation membership card, electronic door access card and debit card (for food, photocopying and laser printer copies).
The Campus ONEcard is issued by the ID Card Office/Campus Security, located in MacEwan Student Centre, Room 260. The office is open Monday to Friday 08:30-16:30 with extended hours (until 18:00) at the beginning of the fall and winter terms. Please check this web site for extended hours of operation: www.ucalgary.ca/security.
To report a lost or stolen card please phone 403.220.7290.
All financial/debit functions of the Campus ONEcard are handled by the Campus Card Office, located in the Dining Centre, Room 01, telephone: 403.220.4922.
For more information on these services please check this website: http://www.ucalgary.ca/campuscard/.

Hotel and Conference Services
Hotel and Conference Services is a department on campus that offers accommodations to individuals or groups visiting Calgary or the University Campus. We offer a variety of accommodations and meeting space, to meet the needs of various guests.

Summer Housing
Through the summer months (early May to early August), the student residence buildings open to welcome all types travelers. Guests do not need to be affiliated with a group or the University to stay on campus; Summer Housing is perfect for the budget conscious traveler that does not wish to compromise on quality of comfort.
Summer Housing accommodations range from one, two or four bedroom apartments to traditional dormitory rooms. During the summer months Hotel & Conference Services can accommodate groups of up to 1,500 people.
Within Hotel & Conference Services, located in our residence buildings there are two fully furnished two bedroom apartments. These apartments are available for guests seeking accommodations on a month to month basis. Two bedroom fully furnished apartments are available year round.
For more information please contact Hotel & Conference Services at:
Telephone: 403.220.3203
Email: confserv@ucalgary.ca
Website: www.ucalgary.ca/hotelandconference

Hotel Alma
In addition to the Summer Housing Operation, Hotel Alma was introduced to the UofC in October of 2009. Hotel Alma is one of the first full service hotels in Canada to be located in the heart of a university campus.
Hotel Alma features 96 rooms and suites, a stylish bistro, and conference facilities for up to 125 attendees- all conveniently close to campus activities and amenities. Hotel Alma welcomes guests from the campus community and beyond year round.
For more information, please contact Hotel Alma at:
Telephone: 403.220.3203
Email: stay@hotelalma.ca
Website: http://hotelalma.ca
Location: Hotel Alma – 169 University Gate NW
Meetings and Special Events

Whether you need to arrange a one day meeting or multi-day event, our meetings and special event staff will assist you in organizing the essential details. Services include:

- Catering and food service arrangements - www.dineoncampus.ca/UofCalgary
- Coordination of audio-visual requirements
- Other event logistics as required

We provide meeting and special event planning for:
- Hotel Alma
- Olympic Volunteer Centre
- The Dining Centre

For more information please contact Meetings and Special Events at:
Telephone: 403.220.6086
Email: hkeen@ucalgary.ca
Website: www.ucalgary.ca/hotelandconference

Conference Management

One of the many features of Hotel and Conference Services is our Conference Management Packages. These packages are designed to help organize the logistics of planning your next conference. Our experienced staff specialize in everything from conference registration to complete conference management. To ensure the success of your event, we will work with you to select the services and support that you require.

For more information please contact our Conference Management Team:
Jill Blackie
Telephone: 403.220.2083
Email: jblacki@ucalgary.ca
Website: www.ucalgary.ca/hotelandconference

Residence Services

Please see the Student Services section of this Calendar for further information on Residence Services for students.

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.

Students are expected to take the necessary training to allow them to anticipate, recognize, evaluate and control the hazards they may encounter during course activities on campus, and to follow established procedures. These activities may include working in a laboratory, workshop or during field studies off site. By understanding and following safe work practices at the University, the student will be better prepared when entering their vocation.

The EH&S website provides information on legislation; policies and procedures; safety courses and on-line registration; as well as other health and safety related information and guidance.

Environment, Health and Safety can be contacted at:
Telephone: 403.220.6345
Website: http://www.ucalgary.ca/safety

Libraries and Cultural Resources

Libraries and Cultural Resources combines the expertise and services of the University’s information providers - the University Archives and Special Collections, the University Library, The Nickle Arts Museum, and the University of Calgary Press - to assure students, faculty, and staff easy access to a wealth of research materials, expertise and services. In September 2011, these resources will be housed in the new six-storey Taylor Family Digital Library (TDFL), a unique combination of library, centre for scholarly communication, student success centre, alumni office, and the centre for arts and culture including the archives, special collections and art gallery.

All of these resources come alive with technology that encourages exploration and new ways of learning, making the Taylor Family Digital Library one of the most information-rich facilities in Canada.

The Library is ranked among the largest research libraries in Canada, with a collection that spans over nine million objects including books, journals, maps, artifacts, works of art, rare books, special collections, music scores.

The Learning Commons on the first three floors of the TDFL is the hub of activity for students, faculty, staff and visitors. Students take advantage of desktop and software support to do research, complete assignments and work collaboratively. Knowledgeable staff assist with reference questions, information navigation, and technology support.

The new Learning Commons is a light-filled area with comfortable furniture, 100% wireless and cellular coverage, collaborative work rooms, individual workstations, and access to plug-ins for laptops.

For student convenience, the Learning Commons is open 24 hours for maximum study time during term.

The upper floors on the TDFL house more than half a million of the latest and most frequently used books, journals and research materials. The Centre for Arts and Culture encourages closer study of fine art and archival materials, while researchers can browse the wealth of resources on performing arts, art, architecture and music.

The Taylor Family Digital Library is located at the heart of the campus, with five branch libraries situated near the faculties or departments that use their services most frequently: Gallagher Library of Geology and Geophysics, Health Sciences Library, Bennett Jones Law Library, the Doucette (Education), and the Haskayne Business Library.

The University Library is open 90 hours each week, offering access to the resource materials as well as reference assistance, specialized information consulting and instruction in the skills and process of information retrieval and management to equip independent learners for success in the knowledge era.

Library resources and services are also ‘delivered to your desktop’ via our online information system, featuring the Library catalogue, an extensive selection of networked databases, electronic information resources and services for distance learning.

Telephone: 403.220.5962
Fax: 403.282.1218
Email: libinfo@ucalgary.ca
Web: http://library.ucalgary.ca/

Archives and Special Collections

Archives and Special Collections is comprised of three units, Canadian Architectural Archives, Special Collections and University Archives that together acquire, maintain and provide access to print and archival collections of enduring value to support inquiry, learning, teaching, research and effective recordkeeping at the University of Calgary.

Canadian Architectural Archives collects, preserves and ensures access to the records of twentieth century Canadian architects and architectural firms to support learning and teaching through instruction, reference, exhibitions and publications. Web: http://caa.ucalgary.ca/.

Special Collections acquires, preserves and makes accessible print and archival collections with a strong focus on Canadian literature, art, music and Western Canadian history. It includes archives of authors like W.O. Mitchell, Mordecai Richler, and Alice Munro, and rare books and incunabula including a leaf of the Gutenberg Bible. http://asc.ucalgary.ca/sc.

The University Archives preserves and builds the institutional, administrative, research and cultural heritage of the University of Calgary by acquiring, maintaining and developing guidelines for the retention of all records of permanent value created and received by university. It also aggressively acquires private records which pertain to areas of research pursued on campus and in the region, including the political development of Western Canada and post-secondary education in Southern Alberta. Web: http://archives.ucalgary.ca/.

Archives and Special Collections is located on the 12th floor of the MacKinnie Library Tower. It is anticipating moving to the 5th floor of the Taylor Family Digital Library during the summer/autumn of 2011. Research
services are available Monday to Friday, from 10:00 am to 4:30 pm.
Telephone: 403.220.7271
Web: http://asc.ucalgary.ca/
Email: archives@ucalgary.ca

Visual Resources Centre
The Visual Resources Centre provides educational video and image collections and services in support of teaching, learning and research for all University of Calgary programs, including provision of bookable viewing facilities and assistance in identifying and using these resources. The VRC is comprised of a multi-disciplinary video collection of over 10,000 DVD/VHS/film titles and an image collection of over 250,000 slides and 60,000 digital images addressing subject areas from prehistoric civilization to modern gardens. These educational collections can be used by individuals or in classroom situations.
Email: vrc@ucalgary.ca
Location: MacKinnie Library Block 040, Lower Level (downstairs from Enrolment Services)
Web: http://library.ucalgary.ca/vcr

University Press
The University of Calgary Press publishes 15 scholarly books a year and provides its imprint to nine scholarly journals. Each of our publications is peer-reviewed, and we publish emerging and experienced authors from the University of Calgary and around the world. In the coming year we will be publishing in print, eBooks and open access formats.

Publishing interests include: Art & Architecture; African Studies; Environment and History; Latin American and Caribbean Studies; The West, Northern Studies, Cinema, and Canadian defence and strategic studies.

Journals: Journals currently published under the UC Press imprint are: ARIEL - A Review of International English Literature; Canadian Journal for the Study of Adult Education; Canadian Journal of Counseling; Canadian Journal of Latin American and Caribbean Studies; Canadian Journal of Philosophy; Canadian Journal of Program Evaluation; Journal of Mind-Body Regulation; Currents: New Scholarship in the Human Services; and Mouseion - Journal of the Classical Association of Canada. Many of our journals can now be accessed online through the Synergies project http://synergiesprairies.ca/.

The Nickle Arts Museum
Note: The Nickle will be closed for exhibitions after September 17, 2010 as it prepares for its move to the Taylor Family Digital Library and its grand re-opening exhibition in September 2011. Some programs will continue during this phase. Please check our website for special events and programming during the transition.

The Nickle Arts Museum (the Nickle) is an outstanding centre for object based learning, academic research and aesthetics. Originally located on the west campus next to MacEwan Hall, the Nickle offers a full program of exhibitions and events addressing compelling social, historical and contemporary cultural topics. The Nickle opened in 1979, built with a bequest to the University of Calgary by the late Calgary oilman Samuel C. Nickle. The later donation by his son, Dr. Carl Nickle, created the base of the museum’s exceptional numismatic collection.

The museum promotes critical thinking, visual literacy, and experiential learning through provocative exhibitions, tours, lecture series and symposia. The Nickle’s programming is centred on modern and contemporary Canadian art, on numismatics, and on carpets and textiles and extends to historic and international art, indigenous heritage, anthropology, history, and popular culture.

The Nickle Arts Museum is home to outstanding collections of art, numismatics and textiles. The art collection concentrates on Western Canadian art of the twentieth century and extends to artists of national importance. The numismatic collection now comprises approximately 20,000 items, the majority of which are from the ancient Mediterranean region, but also includes paper money and ethnographic numismatic items from around the world. The carpet and textile collection is the largest in any Canadian museum, consisting mainly of the tribal or cottage woven carpets of Central and West Asia. These collections and exhibitions support teaching and research from across the University of Calgary, and are available to visiting scholars and classes from all disciplines. The Nickle is central to the minor degree in Museum and Heritage Studies offered through the Faculty of Arts.

The Museum Shop offers a wide selection of unique giftware, stationery and jewelry, in addition to an excellent selection of art publications.
Telephone: 403.220.7234
Fax: 403.282.4742
Email: nickle@ucalgary.ca
Website: http://www.ucalgary.ca/nickle

The Teaching and Learning Centre
The Teaching and Learning Centre (TLC) provides leadership and support for teaching, learning and curriculum innovation to faculty and graduate students at the University of Calgary in three main areas:

Teaching and learning development, and innovation
Educational application of learning technologies
Disseminating research and facilitating communities of inquiry associated with teaching, learning, and technology

Teaching development
Members of the University of Calgary community can inquire into their instructional development and delivery skills, and teaching scholarship through a variety of TLC services:

• Instructional Skills Workshop and University Teaching Certificate for graduate students
• Instructional Skills Workshop and Faculty Teaching Certificate for faculty members
• Teaching in Canadian Classrooms Workshop for international professors, instructors and teaching assistants
• Course Design Workshop for faculty and graduate students
• TA Preparedness Workshop for graduate students
• Summer orientation for new faculty
• Consultation on inquiry approaches and blended learning
• Consultation on curricular redesign within the context of the UC Learning Plan
• Individual consultation on personal practice, mentorship, presentation style, and more
• A systematic offering of faculty development workshops
• A comprehensive repository of teaching and learning resources on the TLC website

Learning technologies to enhance teaching
Appropriate use of technology can extend and enhance the learning experience. Our in-house expertise in media and teaching practice can offer faculty and graduate students a range of opportunities:

• Use of audio and videoconferencing facilities
• Training on standard course management systems
• Full media creation for teaching and learning projects including award-winning
audio/video production, graphic and instructional design, and project management for delivery in any format.

**Fostering and disseminating research associated with teaching, learning, curriculum and learning technologies**

The TLC is an extensive, collegial community of faculty, students, staff and external partners - all committed to creating new knowledge about teaching and learning. The TLC is developing communities of practice and affiliate relationships with university-wide and faculty-based initiatives. The TLC has produced a series of short articles and position papers on various related topics such as inquiry, blended learning, communities of inquiry, and knowledge management.

Location: Room 540, Biological Sciences Building
Telephone: 403.220.4949
Fax: 403.282.0730
Email: tlcfeedback@ucalgary.ca
Website: http://tlc.ucalgary.ca/

**University of Calgary Alumni Association**

When university students graduate, they officially join a family of alumni-fellow graduates who share similar experiences and memories of a profound time of their lives. At the University of Calgary, we include all students as part of this growing family; after all, undergraduates are alumni in the making. The U of C’s alumni family is 145,000 strong and our alumni make remarkable contributions to the business, health, social, cultural and political life of Calgary and communities around the world.

Two-thirds of U of C alumni stay in Calgary to live and work and our alumni are found in more than 148 countries around the world, expanding the U of C’s global reach every year.

The Alumni Association’s role is to keep our alumni connected to the university, to each other and to their communities; to support them in their pursuits throughout their lives and to celebrate their achievements.

Each year the Alumni Association is proud to recognize the contributions of three of our finest through the Arch Awards, the highest honour we bestow: the Distinguished Alumni Award and Graduate of the Last Decade (GOLD) Award. An outstanding future graduate is recognized with the Future Alumni (GOLD) Award. Membership in the alumni family has its benefits. U of C alumni get great deals through our affinity partners: Canada Life, MBNA, MedjetAssist, TD Insurance Meloche Monnex and Wellington West. Other perks include savings on resort accommodations, discounts at local retailers and reduced rates on spa services, airport parking and more. Alumni also receive invitations to events and free subscriptions to U Magazine and ArchE, our monthly alumni e-newsletter. Be sure to keep your contact information current so we can keep in touch with you.

Do you have questions or need more information? Contact us Monday to Friday, 8:30 a.m. to 4:30 p.m. drop by the Alumni Relations service office or visit us online.

Telephone: 403-220-8500 or 1-877-220-8509
Email: alumni@ucalgary.ca
Website: www.ucalgary.ca/alumni

**University Theatre Services**

**Website:** http://arts.ucalgary.ca/theatres/

**The University Theatre**

The University Theatre provides seating for 505 persons, with performance facilities for drama, music, dance, films, exhibitions and lectures. After academic needs are met, the University Theatre is available for a wide variety of community uses.

**The Rozsa Centre**

The Rozsa Centre houses the 384-seat Eckhardt-Gramatte Hall, a music performance and teaching facility for the Department of Music and the Husky Oil Great Hall, a conference facility for the International Centre. It also houses the Rozsa Recording studio - a state-of-the-art digital audio recording studio capable of producing professional quality recording masters. The Rozsa Centre is available for community booking through University Theatre Services.

**The Reeve Theatre**

The Reeve Theatre is the Department of Drama’s primary research and public performance facility, a strategic site of experiential learning for both undergraduate and graduate programs in Drama.

This facility is an experimental theatre laboratory, a unique concept combining the requirements of performance with responsibilities for experimental instruction in the dramatic arts. The Reeve Theatre is not available for community booking.

**Boris Roubakine Recital Hall**

The Boris Roubakine Recital Hall is a 200-seat lecture theatre converted to provide performance facilities for small music recitals, film presentation, slide shows and similar events. It is available for both academic and community use.

**Research Institutes and Centres**

**University Research Institutes and Centres**

- Alberta Global Forum
- Arctic Institute of North America
- Biogeosciences Institute (formerly B.I. of Kananaskis)
- Calgary Centre for Clinical Research
- Calgary Centre for Research in Finance (CCRF)
- Calgary Institute for Population and Public Health
- Calgary Institute for the Humanities
- Centre for Advanced Technologies In the Life Sciences (CAT)
- Centre for Bioengineering Research and Education (CBRE)
- Centre for Environmental Engineering Research and Education
- Centre for Health and Policy Studies
- Centre for Information Security and Cryptography (CISac)
- Centre for Mathematics in Life Sciences
- Centre for Military and Strategic Studies
- Centre for Public Interest Accounting (CPIA)
- Centre for Research in the Fine Arts (CRFA)
- Centre for Social Work Research and Development
- Clinexus
- Consortium for Peace Studies
- Hotchkiss Brain Institute
- INFORMATICS Research Centre
- Institute for Biocomplexity and Informatics
- Institute of Environmental Toxicology
- Institute for Gender Research
- Institute for Quantum Information Science

is available for community booking through University Theatre Services.

**About the University of Calgary**

The University of Calgary is a public research institution located in Calgary, Alberta, Canada. It offers undergraduate, graduate, and doctoral programs across a wide range of disciplines. The university is known for its research excellence and commitment to community engagement. The campus is home to a vibrant community of students, faculty, staff, and alumni, fostering a dynamic and supportive learning environment. The University of Calgary is a leader in various fields, including health sciences, engineering, business, and the arts, offering a diverse range of academic opportunities. Students can choose from a variety of programs in areas such as business, health sciences, engineering, computer science, and more. The university is proud to support a strong alumni network, providing resources and events to help its graduates stay connected and engaged. The University of Calgary also offers research institutes and centres that focus on specific areas of study, promoting collaboration and innovation. The campus is an inclusive and welcoming community that values diversity and excellence in all its endeavors.
Partnership Research Institutes

- Institute for Security, Privacy and Information Assurance
- Institute for Space Research
- Institute for Space Imaging Science
- Radio Astronomy
- Institute for Subsurface Imaging
- Institute for Sustainable Energy, Environment and Economy (ISEE)
- Institute for United States Policy Research
- International Resource Industries & Sustainability Centre
- International Social Development Unit
- Julia McFarlane Diabetes Research Centre
- Language Research Centre
- Latin American Research Centre
- Pipeline Engineering Centre (PEC)
- Population Health Intervention Research Centre (part of the Calgary Institute for Population and Public Health)
- Risk Studies Centre
- School of Public Policy
- Stephenson Cardiovascular MR Centre
- Sun Centre for Visual Genomics
- World Tourism Education and Research Centre (WTERC)

Networks of Centres of Excellence

- ArcticNet
- AUTO21 - The Automobile of the 21st Century
- Canadian Arthritis Network
- Canadian Bacterial Diseases Network - CBBDN
- Canadian Genetic Diseases Network - CGDDN
- Canadian Institute for Photonic Innovations
- Canadian Language & Literacy Research Network
- Canadian Stroke Network - CSN
- Canadian Water Network - CWN
- Geomatics for Informed Decisions Network
- Institute for Robotics and Intelligent Systems - IRIS
- Intelligent Sensing for Innovative Structures - ISIS
- Mathematics of Information Technology and Complex Systems
- Micronet - Microelectronic Devices, Circuits and Systems
- PrioNet Canada
- Protein Engineering Network - PENCE Inc.
- Stem Cell Network (STEMNet)
- Sustainable Forest Management Network - SFM
- TeleLearning Network

International Education: UC International

Study Abroad and Student Exchange Programs

UC International is headed by the Vice Provost International http://www.ucalgary.ca/provost/vp/vpint

Study Abroad for UofC Students

International Student Programs & Advising International Partnerships, Visitors & Exchange Programs

UC International offers a variety of study abroad options in more than 50 countries including; Student Exchange Programs for a term or full year; Semester Abroad Programs in Czech Republic and Spain with U of C courses taught on site; Field Schools to selected sites which offer intensive study opportunities abroad with U of C faculty members during Spring and Summer Terms and Block Weeks. Students may also use their initiative to design their own program of study.

While some study programs require knowledge of a language other than English, not all the U of C 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 UCI or taking part in events to promote discussion and an international understanding: refer to “Make Your Degree More International” section of University Calendar for more information. In September 2009 the UofC opened the Dr. Fok Ying Tung International House, an international residence for students and visiting scholars as well as a full service hotel with meeting rooms. Senior university students have the opportunity to live in an international setting “Global Village” in the middle of campus.

The University of Calgary opened its first branch campus “UofC Qatar” in Fall 2007 offering a Bachelors of Nursing and post degree diploma programs to residents of the Gulf region. The UofC celebrated it’s first graduating class from UCQatar in June 2010.

The University’s International education, international development, international business, student exchange and study abroad programs involve many countries around the world. For further details consult the International Directory available at www.ucalgary.ca/uci.

Focus Countries in the following regions reflect countries where a range of institutional activities are evident including; collaborative research, development projects and student activity.

**Americas:** United States, Mexico, Ecuador, Central America (development projects in Nicaragua, Honduras and El Salvador)

**Africa:** Ghana, Tanzania

**Asia/Pacific:** China (including Hong Kong), India, Australia

**Europe:** Germany, France, Netherlands, Norway, UK

The University’s International education, international development, international business, student exchange and study abroad programs involve many countries around the world. For further details consult the International Directory available at www.ucalgary.ca/uci.

UC International is headed by Professor Carol D. Stewart, Vice Provost International http://www.ucalgary.ca/provost/vp/vpint

**Institution Highlights**

- UofC undergraduate students participate in a “Global Leadership and Innovation” program in Shantou, China funded in part by the Li Foundation.
- The UCI Speakers Series featured President Craig Kielberger (2011) speaking on how University students can make a difference. Previous speakers include Vicente Fox (former President of Mexico, 2000-06) in Fall 2009 and Gwynne Dyer (author/journalist) in Winter 2010.
- There are more than 2500 international students at the UofC and the five countries from which we receive the largest number of international students are: China, Iran, the USA, India and Saudi Arabia.
- The University of Calgary has developed a Master’s program in energy and the environment offered in Quito, Ecuador.
- Through the Choquette Family Foundation Global Experience Awards, the UofC offers ten $10,000 awards each year for students spending an extended period of time studying abroad.
- The Student Refugee Committee of the Students’ Union sponsors a new refugee student 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 UofC exchange programs are Australia, the UK, South Korea and the Netherlands.
- The University of Calgary offers Semester Abroad programs for undergraduates in the Czech Republic, and Spain. Architecture graduate students may spend the Fall term in Barcelona Spain and/or the Winter term in Adelaide, Australia.
- In 2010, more than 1000 University of Calgary students studied abroad as part of their degree programs. Many participate in spring or summer schools abroad.
- The UofC offers more than $750,000 a year in academic scholarships and awards to undergraduate international students attending the university for degree programs.
- In Winter 2011 the UofC hosted a Youth Day Conference on campus as part of the larger Calgary meeting of the InterAmerican Development Bank AGM. Student Leaders from several countries throughout the Americas were hosted and matched with UofC student leaders for the one day event.

**Main offices involved in international education:**

http://www.ucalgary.ca/international
Centre for International Students & Study Abroad (CISSA)
Room 275 MacEwan Student Centre
Tel: 403.220.5581
Fax: 403.289.4409
Email: cissa@ucalgary.ca
Calgary Points of Interest

A. The University of Calgary is located in the north-west quadrant of the city. It's accessible by bus or LRT. The cost of a one way fare is $2.75.

B. Calgary International Airport is a 25 minute taxi ride to the University; cost is approximately $30-$35.

C. Stampede Park is the site of the Greatest Outdoor Show on Earth, The Calgary Stampede, which takes place every year in early July. It is also the site of the Pengrowth Saddledome, which is the home of our National Hockey League team, the Calgary Flames.

D. The Calgary Zoo, Botanical Gardens and Prehistoric Park is a world class zoological institution filling roles in public education, wildlife conservation, research, captive breeding of endangered species and public recreation.

E. Heritage Park Historical Village is Canada's largest living historical village. Turn of the century town, steam trains, and vintage vehicles. Ride the stern-wheeler “S.S. Moyie” around the waters of the Glenmore Reservoir.

F. Mount Royal University, Calgary's community college, offers an innovative blend of educational opportunities including diplomas, certificates, degrees and university transfer programs.

G. SAIT. The Southern Alberta Institute of Technology is known worldwide for its quality technical education and hands-on training. The Alberta College of Art and Design is also on this site.

H. Fort Calgary Site, the historic origins of the city. It is now a 40-acre riverside park.

I. Canada Olympic Park. Capture the Olympic spirit and visit the ski jump tower or the Olympic Hall of Fame. Day and evening skiing is available. Check out the bobsled run.

J. The Golf Dome at Fox Hollow. This year-round golf driving range has two levels.

K. The Southern Alberta Jubilee Auditorium is a multi-purpose performance space opened in 1957 to commemorate Alberta's 50th anniversary as a province.

L. The Glenbow Museum houses exhibition space as well a an archive and library. It has permanent displays of Western Canadian history.

M. Alberta Science Centre. Learn about the wonders of science and visit the Discovery Dome.
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