Native Languages NTVE

Offered by the Department of Linguistics in the Faculty of Social Sciences.

Department Head – R.W. Murray

Junior Courses

Native Languages 205 **H(3-0)**

Native Language I

Primary emphasis on the acquisition of conversational skills and vocabulary. Different Native languages may be offered from time to time.

Note: See the Master Timetable for specific offerings.

Native Languages 207 **H(3-0)**

Native Language II

Continuation of Native Languages 205 with special attention to grammatical structures and written materials.

Prerequisite: Native Languages 205 or equivalent proficiency (in the same language).

Note: See the Master Timetable for specific offerings.

Northern Planning and Development Studies NPDS

Instruction offered under the direction of the Faculty of Communication and Culture. For information contact the Program Director or the Academic Programs Office, 220-6343.

Additional interdisciplinary courses are offered under the course headings African Studies, Canadian Studies, Central and East European Studies, Communications Studies, Development Studies, East Asian Studies, General Studies, Latin American Studies, Law and Society, Leisure, Tourism and Society, Museum and Heritage Studies, Science, Technology and Society, South Asian Studies, and Women's Studies.

Senior Courses

Northern Planning and Development Studies 401 **H(3-0)**

Sustainability and Human Ecology in the Circumpolar Arctic

The history of northern development and resource management in Canada with emphasis on specific case studies involving sustainability and human ecology in the Circumpolar Arctic.

Prerequisite: Development Studies 393.

Note: Credit for both Northern Planning and Development Studies 303 and 401 will not be allowed.

Northern Planning and Development Studies 405 **H(3-0)**

Traditional Environmental Knowledge and Northern Development

The role of traditional environmental knowledge and its significance to northern development. Participatory research methodologies will be introduced.

Prerequisite: Northern Planning and Development Studies 401.

Note: Credit for both Northern Planning and Development Studies 305 and 405 will not be allowed.

Northern Planning and Development Studies 407 **H(3-0)**

Cultural Land-use Mapping

The role of participatory research methodologies as a means of obtaining traditional environmental knowledge. The application of traditional environmental knowledge to land-use mapping technology in the context of geographical information systems will be explored.

Prerequisite: Northern Planning and Development Studies 401.

Note: Credit for both Northern Planning and Development Studies 307 and 407 will not be allowed.

Northern Planning and Development Studies 411 **H(3-0)**

Planning and Community Development in the Context of the North

Complementary to other Northern Planning and Development Studies courses, this course is intended to explore further the tools of community economic development and practical means of involving community partners.

Prerequisite: Northern Planning and Development Studies 401.

Note: Credit for both Northern Planning and Development Studies 311 and 411 will not be allowed.

Northern Planning and Development Studies 500 **F(0-3S)**

Internship Project

An integration of skills learned in previous Northern Planning and Development Studies courses culminating in an individual or group project. The internship will relate to community development issues and to research and development activities in a Canadian or international context.

Prerequisites: Northern Planning and Development Studies 405, 407 and 411.

Nursing NURS

Instruction offered by members of the Faculty of Nursing.

Note: The University of Calgary Bachelor of Nursing program is presently in a development stage and therefore the University reserves the right to make whatever changes are necessary to the content and the hours of instruction of individual Nursing courses in the program. Some of the Nursing course prerequisites and corequisites may be waived for Bachelor of Nursing Accelerated Track students in order to accommodate block scheduling.

Note: Where applicable, Clinical Practice courses must be taken concurrently with the theoretical components.

The following core Nursing courses are for Conjoint Nursing students:

571	574
572	

The following core Nursing courses are for students in the University of Calgary Bachelor of Nursing program.

(*Regular Track students only)

201	307
203	309
205	311
207	401
209	402
211	403
213*	404
301	405
302	406*
303	501
305	502

The following core Nursing courses are for Post Diploma students:

411	531
421	532
441	539
461	542

Nursing 001 **(180 hours)**

Nurse Practitioner Practicum IV

Consolidation of components of NP role in specialty or primary care focus.

Prerequisites: Nursing 645 and 667.

NOT INCLUDED IN GPA

Junior Courses

Nursing 201 **H(3-0)**

Introduction to Nursing

Basic concepts of nursing, individual, family, community, health, environment, and the relationships among them. Historical development of the nursing profession, its unique position within the health care system, and the roles of various health care providers.

Corequisites: Nursing 203/205.

Nursing 203 **H(0-3)**

Foundations for Nursing Practice

Development of skills applicable to nursing practice.

Corequisites: Nursing 201/205.

Note: Minimum passing grade is "C."

Nursing 205 **H(3-0)**

Therapeutic Interventions

Nursing therapeutics and pharmacology in wellness and illness states across the lifespan.

Corequisites: Nursing 201/203.

Nursing 207 **H(3-0)**

Nursing Inquiry

Continuing development of a conceptual framework for nursing practice. Development of a theoretical base for understanding various human responses to health experiences.

Prerequisites: Nursing 201/203/205.

Corequisites: Nursing 209/211.

Nursing 209 **H(104 hours)**

Nursing Practice

Continuing development of skills for nursing practice with opportunity to apply assessment, psychomotor and communication skills in the helping relationship.

Prerequisites: Nursing 201/203/205 and current CPR Basic Cardiac Life Support.

Corequisites: Nursing 207/211.

NOT INCLUDED IN GPA

Nursing 211 **H(2-3)**

Health Assessment

Knowledge and basic skills needed to complete a health history and a holistic assessment of healthy individuals. Students will practice health assessment skills on each other.

Prerequisites: Nursing 201/203/205, Zoology 269 and current CPR Basic Cardiac Life Support.

Corequisites: Nursing 207/209.

Note: Minimum passing grade is "C."

Nursing 213 **H(80 hours in Spring Session)**

Consolidation Practicum I

Integration of learning and continuing development of professional relationships with individuals and families experiencing health challenges in selected settings.

Prerequisites: Nursing 207/209/211, Zoology 269 and current CPR Basic Cardiac Life Support.

Note: Minimum passing grade is "C."

Senior Courses

Nursing 301 **H(3-0)**

Adult Health Theory

Focus on expanding the theoretical understanding of the adult experiencing complex acute and chronic illness.

Prerequisite: Nursing 213.

Prerequisite or Corequisite: Nursing 311.

Corequisite: Nursing 302.

Nursing 302 **F(208 hours within one session)**

Adult Health Practice

Managing care from a holistic and interdisciplinary perspective for more acutely and chronically ill patients with a primary focus on the adult in acute medical/surgical settings.

Prerequisites: Nursing 213 and current CPR Basic Cardiac Life Support.

Prerequisite or Corequisite: Nursing 311.

Corequisite: Nursing 301.

Note: Minimum passing grade is "C."

Nursing 303 **H(3-0)**

Psychiatric/Mental Health Theory

Exploration of concepts related to individuals and families experiencing mental health and illness.

Prerequisite: Nursing 213.

Corequisite: Nursing 305.

Nursing 305 **H(128 hours within one session)**

Psychiatric/Mental Health Practice

Application of concepts, values, and skills with individuals, groups, and families experiencing mental health and illness.

Prerequisites: Nursing 213 and current CPR Basic Cardiac Life Support.

Corequisite: Nursing 303.

Note: Minimum passing grade is "C."

Nursing 307 **H(3-0)**

Nursing of Families

Exploration of family nursing theory, models, and relational nursing practices which involve and support families within a variety of nursing practice contexts.

Prerequisite: Nursing 213.

Nursing 309 **H(3-0)**

Nursing Research

Overview of research methodologies with emphasis on the critique of research and its use in nursing practice.

Note: Completion of a statistics course is strongly recommended prior to taking Nursing 309.

Nursing 311 **H(3-0)**

Pathophysiology

An overview of human pathophysiological concepts at the cellular, organ and systems level.

Prerequisite: Zoology 269.

Nursing 401 **H(3-0)**

Community Health Theory

Exploration of concepts related to the focus of the community as a client. Public health, populations at risk for physical and psychosocial disruptions in health, environmental health, cultural health patterns and beliefs, group dynamics and communications with groups.

Prerequisites: Nursing 213.

Corequisite: Nursing 402.

Nursing 402 **F(208 hours within one session)**

Community Health Practice

Application of concepts, values, and skills with the community as the focus of care. Experiences are drawn from a variety of rural and urban settings.

Prerequisites: Nursing 213 and current CPR Basic Cardiac Life Support.

Corequisite: Nursing 401.

Note: Minimum passing grade is "C."

Nursing 403 **H(5-0)**

Childbearing/Childrearing Families - Theory

Maternity and child health with family as context; the role of nursing pertinent to wellness patterns and alterations in health in these populations.

Prerequisites: Nursing 213/311.

Corequisite: Nursing 404.

Nursing 404 **F(208 hours within one session)**

Childbearing/Childrearing Families - Practice

Facilitating and assisting childbearing and childrearing families to identify and respond to needs related to health promotion, health maintenance, and illness intervention in a variety of nursing practice settings.

Prerequisites: Nursing 213/311 and current CPR Basic Cardiac Life Support.

Corequisite: Nursing 403.

Note: Minimum passing grade is "C."

Nursing 405 **H(3-0)**

Issues in Professional Practice

The nursing role related to the dynamics of the nursing profession and the health care system; nursing and contemporary health issues.

Prerequisites: Nursing 301/302/303/305.

Nursing 406 **F(160 hours within one session)**

Consolidation Practicum II

Consolidation experience which includes theory and practice opportunities, and prepares students for the final year and selected area of focus.

Prerequisites: All Nursing courses with the exception of Nursing 307/309/405 and senior Nursing options, and current CPR Basic Cardiac Life Support.

Note: Minimum passing grade is "C."

Nursing 411 **H(3-0)**

Nursing Scholarship

Reading, writing and thinking in the profession and discipline of nursing.

Nursing 421 **H(3-0)**

Nursing of Families

Nursing of families in a variety of settings and clinical populations.

Nursing 441 **H(3-3)**

Health Assessment

Assessment of individuals in health and illness including health history and physical examination. Students will be expected to practice assessment skills in a clinical/laboratory setting.

Prerequisites: A course in human anatomy and physiology, and current C.P.R. Basic Rescuer Certificate.

Note: Minimum passing grade is "C."

Nursing 461 **H(4-0)**

Pathophysiology

Selected pathophysiological concepts and their relationship to human systems with an opportunity to explore an area of pathophysiology in depth.

Prerequisite: A course in human anatomy and physiology.

Nursing 501 **H(3-0)**

Advanced Concepts in Nursing Practice

Leadership, management and change within the context of nursing and health care. Exploration of strategies for transition to the graduate role and responsibilities inherent in being a nursing professional.

Prerequisites: Nursing 301/302/303/305.

Nursing 502 **F(312 hours within one session)**

Senior Clinical Practicum

Synthesis, application and further acquisition of knowledge, skills, and attitudes in a selected nursing practice setting. Emphasis on complexity of nursing care with clients (individuals, families and/or aggregates). Selection of focus area will be made through consultation with faculty.

Prerequisites: Nursing 406 and current CPR Basic Cardiac Life Support.

Prerequisite or Corequisite: Nursing 501.

Note: Minimum passing grade is "C."

Nursing 503 **H(39 hours)**

Selected Topics in Nursing

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 511 **H(39 hours)**
(formerly Nursing 503.09)

Introduction to the Use of Music and Sound for the Helping Professions

Survey of recently developed applications of music and sound to integrative health care including traditional music therapy, voice therapy, sonic entrainment, and cross-cultural traditions in the use of music and sound for holistic care.

Prerequisite: Consent of the Faculty.

Nursing 515 **H(3S-0)**

Mind/Body/Integration: Ancient and C ontemporary Healing Practices

Exploration of healing practices based on the concept of mind/body/spirit integration. Experience with selected healing modalities will be provided.

Prerequisite: Consent of the Faculty.

Note: Not open to students with credit in Nursing 503.22, 601.22 or 615.

Nursing 531 **H(3-2)**

Public Health Nursing Theory

Concepts and models related to population-focused nursing with emphasis on community, health promotion, team building, assessment strategies, and planning approaches.

Nursing 532 **F(156 hours within one session)**

Public Health Nursing Clinical Practice

Application and synthesis of concepts and models related to population-focused nursing.

Prerequisites: Nursing 531, current C.P.R. Basic Rescuer Certificate , and proof of current, active A.A.R.N. registration.

Note: Minimum passing grade is "C."

Nursing 539 **H(3-0)**

Research in Nursing

Concepts and process necessary for critiquing research and application to nursing practice.

Note: Completion of a statistics course is strongly recommended prior to taking Nursing 539.

Nursing 542 **F(247 hours within one session)**

Senior Practicum

Synthesis and application of theoretical concepts within a selected area of practice with emphasis on further development of self-directed skills and professional attitudes.

Prerequisites: Nursing 441/532, current C.P.R. Basic Rescuer Certificate, and proof of current, active A.A.R.N. registration.

Note: Minimum passing grade is "C."

Nursing 571 **H(3-0)**

Concepts in Professional Practice

Concepts of leadership, management and change within the context of nursing and health care. Emphasis on effective communication, interpersonal conflict management, professional comportment and interdisciplinary collaboration. Exploration of strateg-ies for transition to the graduate role and responsibilities inherent in being a nursing professional.

Prerequisites: All 400-level Nursing courses or consent of the Faculty.

Nursing 572 **F(234 hours within one session)**

Nursing Focus I

Synthesis, application and further growth of knowledge, skills, and attitudes in a selected nursing practice setting. Emphasis on complexity of nursing care with clients (individuals, families and/or aggregates). Selection of focus area will be made through consultation with faculty.

Prerequisites: All 400-level Nursing courses or consent of the Faculty, and current C.P.R. Basic Rescuer Certificate.

Prerequisite or Corequisite: Nursing 571.

Note: Minimum passing grade is "C."

Nursing 574 **F(234 hours within one session)**

Nursing Focus II

Application and integration of theory and research in nursing practice. Selection of practicum will be made through consultation with faculty.

Prerequisites: All 400-level Nursing courses or consent of the Faculty, and current C.P.R. Basic Rescuer Certificate.

Prerequisite or Corequisite: Nursing 571.

Note: Minimum passing grade is "C."

Nursing 589 **H(3S-0)**

Mind/Body Integration: Philosophical Foundations

Critical analysis of the integrated nature of mind/body/spirit comparing various cultural paradigms as they relate to health and healing.

Prerequisite: Consent of the Faculty.

Note: Not open to students with credit in Nursing 503.11, 601.21 or 689.

Graduate Courses

Nursing 601 **H(3S-0)**

Seminar on Special Topics Related to Health Care and Nursing

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 603 **H(156 hours)**

Independent Supervised Clinical Practicum

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 605 **H(3S-0)**

Philosophical Foundations for Advanced Nursing Practice

Exploration of philosophical foundations of nursing through critical analysis of conceptual frameworks and paradigms for advanced nursing practice.

Prerequisite: Consent of the Faculty.

Nursing 607 **H(39 hours)**

Independent Guided Study

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 611 **H(3-0)**

Advanced Study of Biopsychosocial Phenomena: I

Selected health concepts from biophysical and psychosocial perspectives that can be applied across specialty areas of nursing practice.

Prerequisite: Consent of the Faculty.

Nursing 613 **H(2S-12)**

Advanced Clinical Practicum I

Clinical laboratory in the student's selected clinical specialty area requiring students to validate perspectives discussed in Nursing 611, to utilize assessment or evaluative instruments related to nursing practice, and to test clinical theories in a practice setting.

Prerequisite: Nursing 611.

Nursing 615 **H(3S-0)**
(formerly Nursing 601.22)

Mind/Body Integration: Ancient and Contemporary Healing Practices

Exploration of the healing potential of ancient and contemporary practices based on the concepts of body/mind/spirit integration. Learning methods include seminars on selected topics and experiential activities.

Prerequisite: Consent of the Faculty.

Nursing 621 **H(2S-1)**

Clinical Nursing Research

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: Consent of the Faculty.

Nursing 641 **H(180 hours)**

Nurse Practitioner Practicum I

Opportunity for students to develop advanced knowledge and skills related to clinical decision-making and client management of commonly presented health problems.

Prerequisite or Corequisites: Nursing 661/663/665 or equivalent, or consent of the Faculty, and registration in Post-Master's NP Certificate program or MN/NP program.

NOT INCLUDED IN GPA

Nursing 643 **H(180 hours)**

Nurse Practitioner Practicum II

Opportunity for students to develop proficiency in determining appropriate history, physical assessment, and diagnostic tests to evaluate presenting signs and symptoms of common disorders related to specialty or primary care focus. Students will continue to develop proficiency in clinical decision-making and client management skills.

Prerequisite or Corequisite: Nursing 641.

NOT INCLUDED IN GPA

Nursing 645 **H(180 hours)**

Nurse Practitioner Practicum III

Opportunity for students to demonstrate proficiency in clinical decision-making and case management where clients have complicated and/or potentially life threatening disorders related to specialty or primary care focus.

Prerequisite: Nursing 643.

NOT INCLUDED IN GPA

Nursing 651 **H(3-0)**

Advanced Study of Biopsychosocial Phenomena: II

Selected health concepts from biophysical and psychosocial perspectives that can be applied across specialty areas of nursing practice.

Prerequisites: Nursing 611/613.

Nursing 653 **H(2S-12)**

Advanced Clinical Practicum II

Clinical laboratory in the student's selected clinical specialty area requiring students to validate perspectives discussed in Nursing 651, to utilize assessment or evaluative instruments related to nursing practice, and to test clinical theories in a practice setting.

Prerequisites: Nursing 611/613.

Prerequisite or Corequisite: Nursing 651.

Nursing 661 **H(3S-0)**

Advanced Pathophysiology and Therapeutics

Advanced pathophysiology and therapeutic processes applicable to and derived from students' areas of practice/population of focus. Learning methods include seminars on selected core topics and individually negotiated investigative activities relevant to students' areas of specialization. Some field work is required.

Prerequisite: Consent of the Faculty.

Nursing 663 **H(3S-1)**
(formerly Nursing 601.26)

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: Consent of the Faculty.

Nursing 665 **H(3S-2)**

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: Consent of the Faculty.

Nursing 667 **H(3S-0)**

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: Consent of the Faculty.

Nursing 671 **H(3S-0)**

Advanced Nursing Practice in Organizational Contexts

Systems aspects related to management of complex health problems or risks, creative approaches to client care and systems use, and examination of factors related to the organizational context of professional practice.

Prerequisites: Nursing 611/613.

Nursing 673 **H(2S-12)**

Advanced Clinical Practicum III

Field practicum in a health care delivery setting requiring students to gather corroborative data regarding theory discussed in Nursing 671, to acquire new skills relevant to advanced practice, and to assess and evaluate role function and role interdependencies.

Prerequisite or Corequisite: Nursing 671.

Nursing 681 **H(3S-0)**

Families and Illness

Facilitates understanding of the reciprocity between illness and family dynamics. Emphasis is on the family dynamics when a family member is experiencing a chronic illness, life-threatening illness or a psychosocial problem.

Prerequisite: Consent of the Faculty.

Nursing 683 **H(3S-0)**

Research Applications: Qualitative Data Analysis

Exploration of research methods based primarily on inductive reasoning. Methodologies, issues and techniques of data collection, analysis and appropriate interpretation will be explored. Use of appropriate hardware and software packages for data reduction is included. Emphasis is placed on congruence between data collection and analysis of data sets. Experience will be provided in data collection, data management and data analysis.

Prerequisite: Nursing 621 or equivalent.

Nursing 685 **H(3S-0)**

Family Research

This interdisciplinary course addresses the conceptual and methodological research issues encountered when the family is the unit of measurement and analysis. The focus will be on critique of research addressing family variables in health care and illness.

Prerequisite: Consent of the Faculty.

Note: A graduate level research methods course is required.

Nursing 687 **H(3S-0)**

Advances in Palliative Care

Facilitates understanding of the physical, emotional, intellectual and spiritual aspects of care required by terminally ill patients and families. Interdisciplinary approach to the critical examination of advances in palliative care and their applications to practice.

Nursing 689 **H(3S-0)**

Mind/Body Integration: Philosophical Foundations

Critical analysis of the integrated nature of mind/body/spirit comparing various cultural paradigms as they relate to health and healing.

Prerequisite: Consent of the Faculty.

Note: Not open to students with credit in Nursing 589.

Nursing 701 **H(3-0)**

Doctoral Special Topics

Prerequisite: 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: Consent of the Faculty.

Nursing 707 **H(39 hours)**

Directed Study

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 731 **H(2S-0)**

Doctoral Thesis Seminar

Opportunity for students to discuss their own and other students' research. Before enrolling in this course, students are expected to have identified their area of inquiry.

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

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 multidisciplinary perspective.

Prerequisite: Consent of the Faculty.

Nursing Offsite NUOS

Instruction offered by members of the Faculty of Nursing.

Note: The University of Calgary Bachelor of Nursing program at the Medicine Hat College Site is presently in a development stage and therefore the University reserves the right to make whatever changes are necessary to the content and the hours of instruction of individual Nursing Offsite courses in the program.

Note: Where applicable, Clinical Practice courses must be taken concurrently with the theoretical components.

The following Nursing Offsite courses are for students in the BN program at the Medicine Hat College Site:

451	457
452	458
453	551
454	553
455	554

Senior Courses

Nursing Offsite 451 **H(4-0)**

Childbearing and Childrearing Families (Theory)

The study of maternity and child health with family as context; role of nursing pertinent to wellness patterns and alterations in health in these populations.

Corequisite: Nursing Offsite 452.

Nursing Offsite 452 **F(210 hours)**

Childbearing and Childrearing Families (Nursing Practice)

Facilitating and assisting childbearing and childrearing families to deal with needs related to health promotion, health maintenance, and illness intervention in a variety of nursing practice settings.

Corequisite: Nursing Offsite 451.

Note: Minimum passing grade is "C."

Nursing Offsite 453 **H(4-0)**

Community Focused Nursing (Theory)

Exploration of concepts and models related to the focus of community as client, with emphasis on dimensions of community and population health, health promotion perspectives, team building and partnerships, community assessment, planning and evaluation approaches, and intervention strategies.

Corequisite: Nursing Offsite 454.

Nursing Offsite 454 **F(195 hours)**

Community Focused Nursing (Nursing Practice)

Opportunity to develop skills with the community as the focus of care in a variety of settings.

Corequisite: Nursing Offsite 453.

Note: Minimum passing grade is "C."

Nursing Offsite 455 **H(3-0)**

Nursing Research

Introduction to quantitative and qualitative research methods appropriate to nursing with an emphasis on the critique of studies for their application to practice.

Note: Completion of a statistics course is strongly recommended prior to taking Nursing Offsite 455.

Nursing Offsite 457 **H(3-0)**

Rural Nursing (Theory)

Issues, theory and research related to the delivery and development of health care in rural areas.

Corequisite: Nursing Offsite 458.

Nursing Offsite 458 **F(195 hours)**

Rural Nursing (Nursing Practice)

An integrated approach to nursing in a variety of rural settings with an emphasis on the application of concepts and theory pertinent to rural health care.

Corequisite: Nursing Offsite 457.

Note: Minimum passing grade is "C."

Nursing Offsite 551 **H(3-0)**

Issues in Nursing Practice

An in-depth exploration of issues related to nursing practice and health care organizations.

Corequisites: Nursing Offsite 553/554.

Nursing Offsite 553 **H(3-0)**

Nursing Leadership and Management

Professional and interpersonal relationships in nursing practice with an emphasis on leadership, interdisciplinary collaboration and the management of nursing care at macro and micro levels.

Corequisites: Nursing Offsite 551/554.

Nursing Offsite 554 **F(330 hours)**

Senior Nursing Practice

Synthesis and integration of theoretical concepts from nursing and related disciplines, in the student's area of practice with emphasis on further development of self-directed learning skills to enhance professional practice. During their practicum, students will be under the direction of a Faculty Advisor and Clinical Preceptors.

Corequisites: Nursing Offsite 551/553.

Note: Minimum passing grade is "C."

Operations Management OPMA

Instruction offered by members of the Haskayne School of Business.

Operations Management Chairperson – J. Balakrishnan

Note: Students have the opportunity to take courses offered by the Haskayne School of Business without the stated prerequisites, with the written permission of the Associate Dean (Undergraduate Programs) as appropriate, upon the recommendation of the Instructor of the course. However, should a student fail to achieve satisfactory standing in any course for which the stated prerequisite(s) is (are) lacking, he/she may be required to successfully complete the stated prerequisite(s) prior to being permitted to repeat the course. Students are required to have consent of the Haskayne School of Business Office before registering in 600-level courses offered by the Haskayne School of Business.

Senior Courses

Operations Management 301 **H(3-0)**

Introduction to Production and Operations Management

A survey of the decision processes in production and operations management and their relationship to other business functions. Topics include project planning and scheduling, inventory management, materials requirements planning, quality and maintenance management, capacity planning, facilities layout, and process improvement.

Prerequisites: Any 200-level Mathematics and Statistics 213 (or equivalent, excluding Statistics 201).

Note: Not available for credit toward the Bachelor of Commerce degree. Until August 15, preference in enrollment is given to students who have declared a Management and Society minor.

Operations Management 317 **H(3-1)**

Fundamentals of Operations Management

Introduction to the wide applicability, broad scope, strategic importance and major decisions of operations management, as well as important interactions with other functional areas. Topics covered include the design, control and improvement/innovation of business and other processes, project planning and control, quality management, statistical quality control, inventory management, just-in-time systems, and supply chains. A term project involving an off-campus organization is a significant component of the course.

Prerequisites: Admission to the Haskayne School of Business, second year standing, Management Studies 291 and Statistics 213.

Note: Not open to students with credit in Operations Management 351.

Operations Management 401 **H(3-0)**

Materials and Supply Chain Management

An in-depth treatment of inventory and replenishment management. Topics treated include strategic implications of materials management, common control systems, single echelon decision rules (when and how much to replenishment, recognizing quantity discounts, coordination of items, special opportunities to replenish, etc.), production scheduling, manufacturing resources planning, just-in-time systems, supply chain and other multiechelon considerations, and implications of new information technology. Case studies and a site visit are used, as well as illustrations of spreadsheet modelling.

Prerequisites: Third year standing, Operations Management 317 and Management Studies 391.

Operations Management 403 **H(3-0)**

Managing Quality in Products and Service

An in-depth treatment of quality management practices and techniques for products and services. Topics and techniques covered include process design and improvement, total quality management, team-based problem solving, and process charting. In addition, managerial issues related to process performance measurement and procedures for implementation are discussed.

Prerequisites: Third year standing and Operations Management 317.

Operations Management 405 **H(3-0)**

Service Operations Management

Introduction to the management of service businesses from both a qualitative and quantitative perspective.. Topics include the range of businesses that are called "services," service design and performance measurements, service quality and recovery, managing people in service industries, service demand forecasting, scheduling, managing lineups, yield management, network optimization, and the role of information technology. Industry examples include travel and hospitality, professional services, retail, communication and transportation, banking, etc. An industry project is used to give students the opportunity to apply course concepts.

Prerequisites: Third year standing, Operations Management 317 and Management Studies 391.

Operations Management 407 **H(3-0)**

Introduction to Project Management

Introduction to the management of projects in a variety of settings such as software development

and installation, disaster relief, new product development, advertising campaigns, financial auditing, etc. Material from the organizational, planning, technical, financial, informational, and logistical aspects of project management will emphasize the interdisciplinary nature of projects. Group work related to actual projects will be required. Students will also learn to use commercial computer software for planning and scheduling projects.

Prerequisites: Third year standing and Operations Management 317.

Operations Management 409 **H(3-1)**

Computer Simulation for Business

Computer simulation as an analysis and decision-making tool for all management disciplines. The emphasis is on developing practical skills that students can use when applying simulation to real business problems. Students learn a powerful, user-oriented simulation language as well as advanced spreadsheet simulation tools. Effective management of a simulation project is also emphasized through an applied project.

Prerequisites: Third year standing, Operations Management 317 and Management Studies 391.

Operations Management 411 **H(3-0)**

Field Investigation in Operations Management

Field investigation concerned with improvements in operations activities in an off-campus organization. The students work in teams on a single project. Both oral and written reports are required.

Prerequisites: Third year standing, Operations Management 317 and one 400-level Operations Management course.

Corequisite: One 400-level Operations Management course.

Operations Management 413 **H(3-0)**

Advanced Spreadsheet Modeling using VBA: Business Applications

Spreadsheet Modeling using advanced automation tools provided through Visual Basic for Applications (VBA). Advanced quantitative modeling will be combined with introductory programming and application development to provide decision support systems applied to the fields of operations management, finance and marketing.

Prerequisites: Third year standing, Management Studies 391 and Operations Management 317.

Note: Credit for both Operations Management 413 and 511.02 will not be allowed.

Operations Management 559 **H(3-0)**

Selected Topics in Operations Management

Investigation of selected topics in Operations Management.

Prerequisites: Third year standing, Operations Management 317 and Management Studies 391.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Operations Management 601 **H(3-0)**

Operations Management

Management of the production and/or service delivery system of the organization in concert with marketing, human resources, financial, and information systems. Management decision making on a continuum from day-to-day operating decisions such as inventory and scheduling to long term strategic decisions like capacity and technology choice. Topics covered in the course may include planning/management, product/service design and materials and supply chain management.

Note: Credit for both Operations Management 601 and Management Studies 605 will not be allowed.

Operations Management 719 **H(3-0)**

Project Procurement and Logistics

Procurement planning activities; commercial practice; tendering; bid evaluation; negotiation and award; contract administration; logistics management; transportation; warehousing and inventory management; modularization; regulatory requirements; customs; claims.

Prerequisite: Strategy and General Management 691.

Operations Management 725 **H(3-0)**

e-Supply

Applies e-technology to improve service, reduce costs and enhance customer satisfaction through evaluation, design, and optimization of the supply chain. Examines proven supply chain approaches developed by industry leaders at strategic, operational and tactical levels, as well as emergent but as yet unproved approaches associated with e-tailing, customer relationship management, and mass customisation.

Prerequisite: Management Information Systems 725 or consent of the business school.

Operations Management 743 **H(3-0)**

Simulation of Operational Systems

Computer simulation as a decision-making methodology for all areas of organizations. Topics include model development and validation, design of simulation experiments, generation of appropriate values of random variables, interactive procedures and interpretation of results. A user-oriented language is utilized and an applied project is carried out.

Prerequisites: Operations Management 601 and Management Studies 613.

Operations Management 745 **H(3-0)**

Inventory Management and Production Scheduling

An in-depth treatment of inventory management and production scheduling. Topics treated include ABC classification, commonly used types of control systems, various extensions of the basic economic order quantity (quantity discounts, time-varying demand, coordinated control), choices on deciding when to order, aggregate implications of individual item decision rules, multiechelon inventory systems, materials requirements planning, just-in-time manufacturing, and flexible manufacturing systems.

Prerequisite: Operations Management 601 or Management Studies 605 and 613.

Operations Management 749 **H(3-0)**

Operations Management in Service Systems

The operations management function in service and transportation organizations. Topics include important interfaces with other functional areas, forecasting of demand for services, locations, sizing and layouts of service facilities, work force staffing, service quality assurance, vehicle scheduling, illustrative applications of waiting line models.

Prerequisite: Operations Management 601or Management Studies 605 and 613.

Operations Management 789 **H(3S-0)**

Seminar in the Practice of Operations Management

Projects involving the practical application of operations management concepts or the application of advanced methodology.

Prerequisites: Operations Management 601 or Management Studies 605 and consent of the business school.

MAY BE REPEATED FOR CREDIT

Operations Management 797 **H(3S-0)**

Advanced Seminar in Operations Management

Prerequisite: Consent of the business school.

MAY BE REPEATED FOR CREDIT

PhD Course

Operations Management 799 **H(3S-0)**

Doctoral Seminars in Operations Management

799.01. Operations Management Strategy

799.02. Tactical Research Issues

799.03. Operational Research Issues

Outdoor Pursuits ODPU

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, Dance Education Activity/Theory, Kinesiology, Outdoor Pursuits Activity/Theory, Physical Education, and Physical Education Activity/Theory.

Junior Course

Outdoor Pursuits 201 **H(3-0)**

Foundations of Outdoor Pursuits

An overview of the foundational principles of outdoor pursuits as they pertain to philosophy, wilderness ethics, professional preparation, movement through wildlands, environmental hazards, navigation, and safety.

Senior Courses

Outdoor Pursuits 371 **H(2-2)**

Wilderness Emergency Response

Wilderness Emergency Response and pre-hospital care for the sick and injured. Practical experiences and field scenarios are integrated with lecture material. Successful students receive certification in both CPR and WER.

Outdoor Pursuits 401 **H(2-2)**

Safety in Outdoor Pursuits

An examination of the concept of safety in outdoor pursuits with particular reference to practical risk management of activities and accident/incident analysis.

Prerequisite: Third year standing in Outdoor Pursuits program.

Outdoor Pursuits 403 **H(2-2)**

Experiential Education in Outdoor Pursuits

Experiential, adventure-based, and multidisciplinary programs to educate in and through the out-of-doors.

Prerequisite: Third year standing in Outdoor Pursuits program.

Outdoor Pursuits 443 **H(3-0)**

Administration of Outdoor Programs

An overview of the principles, theories, and practices that are currently used in the administration of outdoor programs, both residential and mobile, with a focus on risk management, legal liability, policies and procedures, and staffing.

Outdoor Pursuits 453 **H(2-2)**

Leadership in an Outdoor Setting

The study and application of the knowledge, skills, and abilities which contribute to effective leadership and facilitation of groups in outdoor settings.

Prerequisite: Third year standing in Outdoor Pursuits program.

Outdoor Pursuits 459 **H(2-2)**

Safety for Winter Wilderness Travel

Winter leadership considerations for extended travel in wilderness areas. Theoretical and practical examination of snow mechanics, avalanche prediction, weather, and other high level winter hazards.

Prerequisites: Outdoor Pursuits Activity/Theory 359, valid CPR Heart Saver qualification or equivalent, and consent of the Faculty.

Outdoor Pursuits 461 **H(2-2)**

Heritage Arts and Wilderness Survival Skills

Survival techniques in a natural environment in the temperate zone of North America with few manufactured items. The use of primitive and modern tools, heritage arts, shelters, and techniques in planned and emergency survival situations.

Prerequisite: Third year standing in Outdoor Pursuits program.

Outdoor Pursuits 491 **H(0-4)**

Practicum in Outdoor Pursuits

Practical field experiences in outdoor pursuits.

Prerequisite: Consent of the Faculty.

Note: Students wishing to take this course must consult with the Outdoor Pursuits Coordinator prior to registration in order that summer work placement can be arranged.

Note: Students must consult with the Pedagogy Coordinator in order to obtain required documentation to comply with the legal requirements for placement in schools.

NOT INCLUDED IN GPA

Outdoor Pursuits 495 **H(3-0)**

Wildlands and Outdoor Pursuits

Reconciling the demands of outdoor pursuits with the preservation of wildlands.

Outdoor Pursuits 503 **H(3-0)**

Special Topics in Outdoor Pursuits

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Outdoor Pursuits Activity/Theory OPAT

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, Dance Education Activity/Theory, Kinesiology, Outdoor Pursuits, Physical Education, and Physical Education Activity/Theory.

Junior Courses

Outdoor Pursuits Activity/Theory 251 **E(0-2)**

Canoeing I

Prerequisite: Students must be competent swimmers before taking this course.

Outdoor Pursuits Activity/Theory 253 **E(0-2)**

Backpacking I

Outdoor Pursuits Activity/Theory 254 **E(0-2)**

Rock Climbing

Outdoor Pursuits Activity/Theory 259 **E(0-2)**

Cross Country Skiing

Outdoor Pursuits Activity/Theory 261 **E(0-2)**

Bicycle Touring

Note: Not open to students with credit in Outdoor Pursuits Activity/Theory 281.

Note: Offered in odd-even dated academic years.

Outdoor Pursuits Activity/Theory 271 **E(0-2)**

Orienteering I

Outdoor Pursuits Activity/Theory 273 **E(0-2)**

Kayaking I

Prerequisite: Students must be competent swimmers before taking this course.

Outdoor Pursuits Activity/Theory 283 **E(0-2)**

Safe Glacier Travel

Safe glacier travel including applied knowledge of glacier geomorphology, hazards, rescue techniques, and group management.

Corequisite: Outdoor Pursuits Activity/Theory 253.

Senior Courses

Outdoor Pursuits Activity/Theory 351 **Q(0-4)**

Canoeing II

Prerequisites: Outdoor Pursuits Activity/Theory 251 and 253.

Outdoor Pursuits Activity/Theory 353 **Q(0-4)**

Backpacking II

Prerequisite: Outdoor Pursuits Activity/Theory 253.

Outdoor Pursuits Activity/Theory 357 **Q(0-4)**

Alpine Climbing

Prerequisites: Outdoor Pursuits Activity/Theory 253, 254, and 283.

Outdoor Pursuits Activity/Theory 359 **Q(0-4)**

Backcountry Skiing

Prerequisites: Outdoor Pursuits Activity/Theory 253 and 259.

Outdoor Pursuits Activity/Theory 373 **Q(0-4)**

Kayaking II

Prerequisites: Outdoor Pursuits Activity/Theory 273 and 253.

Petroleum Engineering ENPE

Instruction offered by members of the Department of Chemical and Petroleum Engineering and the Department of Mechanical and Manufacturing Engineering in the Faculty of Engineering.

Chemical and Petroleum Engineering Department Head – R.G. Moore; Mechanical and Manufacturing Engineering Department Head – P. Gu

Associate Heads: A.A. Jeje and W. Y. Svrcek.

Senior Courses

Petroleum Engineering 423 **H(3-2T-1)**

Oil and Gas Engineering Process Development

General approach to the design of oil and gas processing units and plants; cost estimates and oil and gas process economics; optimization techniques; introduction to linear programming. Safety and environmental considerations in process design. A team design project will be included. Written reports are required.

Prerequisite: Chemical Engineering 315.

Note: Credit for both Petroleum Engineering 423 and Chemical Engineering 423 will not be allowed.

Petroleum Engineering 507 **H(3-1)**

Well Logging and Formation Evaluation

An introduction to fundamentals of wireline well logging and the log interpretation techniques for oil and gas wells. Determination of basic reservoir petrophysical parameters such as lithology, porosity and fluid saturations in the near wellbore region. Types of well logging devices; physics of operation and the mechanical, electrical, acoustic and nuclear response characteristics of various well logging tools. Well log interpretation and its relationship with reservoir geology and geophysics, reservoir engineering, production engineering and drilling engineering aspects. Application of well logs for integrated petroleum reservoir management.

Prerequisite: Permission of the course instructor or consent of the Department.

Petroleum Engineering 509 **H(3-1)**

Well Testing

Basic theory and current techniques for well testing. Drawdown and Build up. Single-rate and multi-rate. Derivative analysis. Fractured wells, fractured reservoirs and other flow models. Advanced decline curve analysis. Computer aided analysis and hands on experience in the computer laboratory.

Prerequisite: Petroleum Engineering 523.

Petroleum Engineering 511 **H(3-4)**

Design for Oil and Gas Engineering I

Team design project applying principles of project engineering and management to the recovery and processing of hydrocarbons. Petroleum design considerations will include; detailed reservoir characterization; well test analysis; recovery and production forecasting; preliminary drilling, completions and facilities design, and economic evaluation. Team designs will be evaluated through both an oral examination and a major written report.

Prerequisites: Chemical Engineering 315, 405; Chemical Engineering 423 or Petroleum Engineering 423; Petroleum Engineering 523.

Note: Credit for both Petroleum Engineering 511 and Chemical Engineering 511 will not be allowed.

Note: Approval of the course instructor is required for Petroleum Engineering Minor students to take Chemical Engineering 511 rather than Petroleum Engineering 511.

Petroleum Engineering 513 **H(3-1T-3/2)**

Flow in Porous Media

Fundamentals of fluid flow in porous media: pore structure; capillarity; single phase flow; immiscible and miscible fluid flow; pore level modelling of porous media. Concepts applied to hydrocarbon reservoirs and fluid migration in soils including; characterization of pore space, single phase flow in porous media, capillarity, wettability, routine and advance core analysis, miscibility in porous media. Similarities and differences between hydrocarbon reservoirs and soils. Introduction to enhanced oil and gas processes.

Prerequisite: Chemical Engineering 331 or Geology 329 or 401.

Petroleum Engineering 515 **H(3-1)**
(formerly Petroleum Engineering 413)

Drilling and Well Completions

An introduction to drilling; overview of petroleum engineering geology; basic rock properties; pressure and temperature relationships. Rotary drilling; drilling rigs; rig components and selection; overview of drilling operations; drilling fluids and mud systems; rotary drilling hydraulics; drill bits, selection and optimization; bottom hole assemblies (BHAs); directional drilling and MWD systems; horizontal and multi-lateral drilling; casing design and casing seat selection; cements and cementation techniques; wellbore pressure and blowout control; formation evaluation (logging, LWD, coring and DST); well completions; formation damage in drilling and completion operations; hole problems; drilling cost control; well planning; underbalanced drilling; coiled tubing drilling; offshore drilling operations. Environmental aspects of drilling and completion operations.

Prerequisite: Consent of the Department.

Petroleum Engineering 519 **H(3-0)**

Special Topics

Current advanced topics in Chemical and Petroleum Engineering.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Petroleum Engineering 523 **H(3-1)**

Introduction to Reservoir Engineering

Description and estimation of rock and fluid properties; reserve estimation using volumetric and material balance methods in gas, gas-condensate and oil reservoirs; discussion of different reservoir drive mechanisms; aquifer models; Darcy's law and single-phase flow through porous media; introduction to well testing, solution of radial diffusivity equation corresponding to infinite-acting and pseudo-steady state flow, of slightly compressible fluids and real gases.

Prerequisites: Engineering 311 and Chemical Engineering 331 or Mechanical Engineering 341.

Petroleum Engineering 525 **H(3-1)**

Waterflooding

Discussion of two-phase flow in media, wettability, relative permeability and capillary pressure; trapping and mobilization of residual oil; immiscible displacement theory; linear waterflood calculations; viscous fingering in immiscible displacements; flood patterns and sweep efficiency considerations; characterization of reservoir heterogeneity; waterflood prediction models - Stiles, Dykstra-Parsons, CGM and Streamtube models; introduction to black-oil simulators; designing a waterflood; monitoring and analysis of waterflooding performance.

Prerequisite: Petroleum Engineering 523 or equivalent.

Petroleum Engineering 531 **H(2-6)**

Design for Oil and Gas Engineering II

Team Design Project continuing from Petroleum Engineering 511. Detailed design of large scale development and commercial exploitation of a petroleum resource. Topics considered will include: reservoir simulation; drilling and completion design; specification of petroleum processing equipment such as heaters, heat exchangers, contacting and separating equipment; safety and environmental issues; economic evaluation. Team designs will be evaluated through both an oral examination and a major written report.

Prerequisite: Petroleum Engineering 511.

Note: Credit for both Petroleum Engineering 531 and Chemical Engineering 531 will not be allowed.

Petroleum Engineering 533 **H(3-0)**

Petroleum Production Engineering

Principles of oil and gas production mechanics. Analysis and discussion of factors governing the flow of fluids from the formation to the surface facility. Reservoir inflow performance. Diagnostic analysis of well test data. Decline analysis. Wellbore hydraulics and multiphase flow. Nodal analysis for optimization of the production system. Methods of well completions and stimulation. Artificial lift. Introduction to surface facilities design.

Prerequisite: Petroleum Engineering 523 or consent of the Department.

Note: Credit for both Petroleum Engineering 533 and Chemical Engineering 533 will not be allowed.

Petroleum Engineering 543 **H(3-0)**

Geological Characterization of Oil and Gas Reservoirs

Introduction to applied special statistics and probability theory; review of petroleum reservoir geology, geological depositional environments, classification of reservoir heterogeneity; an overview of the reservoir modelling methodology. Introduction to various forms of data for reservoir modelling - core data, well log data, well test data, geophysical data; brief review of geostatistics for data integration; assessment of uncertainty in reservoir modelling; basics of flow modelling and assessing the impact of reservoir heterogeneity on the flow response observed at wells.

Prerequisite: Petroleum Engineering 523.

Petroleum Engineering 551 **H(1-4)**

Petroleum Engineering Laboratory

Experiments which demonstrate the operation of chemical or petroleum process equipment involving heat and/or mass transfer kinetics or flow through porous media. Lectures will cover experimental design and applied statistics.

Prerequisites: Chemical Engineering 405 and Petroleum Engineering 523.

Note: Credit for both Petroleum Engineering 551 and Chemical Engineering 551 will not be allowed.

Petroleum Engineering 555 **H(3-1T)**

Oil and Gas Field Safety and Environment

Review of safety issues, blow outs, fire and other hazards, hydrate formation and decomposition, H2S and other toxic gases, safety standards, impact of petroleum operations on the environment, handling and safe transportation and disposal of petroleum wastes.

Petroleum Engineering 561 **H(3-3/2)**

Fuel Science and Technology

Classification of fuels. Origin, geology, production and processing of fossil fuels. Supply, consumption and demand for fuels - historical patterns and future trends. Thermodynamics and reaction kinetics of combustion. Physical and chemical properties and influence on fuel utilization. Ecological, efficiency, safety, economic considerations. Non-conventional fuels. Transportation and handling.

Petroleum Engineering 563 **H(3-0)**

Materials Aspects of Oil and Gas Production

Material selection processes for the oil and gas industry covering piping, vessels and other components. Basics of corrosion, stress corrosion, hydrogen embrittlement. Corrosion prevention techniques for aqueous and gaseous corrosion. High temperature material behaviour and design procedures.

Petroleum Engineering 565 **H(3-0)**

Mechanics of Oil and Gas Production

Overview of drilling rigs and offshore structures. Structural design. Well drilling. Drill string design, casing design. Directional and horizontal wells. Well completion, tubing design. Artificial lift methods: sucker rod pumping system design, pumping units, fatigue loads and rod materials, wave equations, sucker rod optimization. Rotating pumps. Gas lift design. Container and pipeline design.

Prerequisites: Mechanical Engineering 479 and Petroleum Engineering 523.

Philosophy PHIL

Instruction offered by members of the Department of Philosophy in the Faculty of Humanities.

Department Head – A. Kazmi

Illustrative Philosophy Course Groupings

This listing is provided to assist students in their selection of related groups of Philosophy courses. Detailed descriptions of all courses and sections of courses may be obtained from the Department Office.

Introductory:

201 275† 279†
249†

History of Philosophy:

301 369 459
303 405 501
305 443 505
343 445 507
355 457 609

Moral Philosophy:

249† 349 549
313† 447 649
329† 449
347 547

Legal Philosophy, and Social and Political Philosophy:

313† 431 525
319 433 553
329† 453 653
353

Metaphysics and Philosophy of Mind:

321 421 621
381 481 681
407†

Logic:

275† 379 513
279† 479 679
377

Philosophy of Logic, Philosophy of Language:

307† 571† 691
407† 671

Epistemology and Philosophy of Science:

363 467 567
367 517 663
463 565 667

Contemporary Philosophy:

307† 409 509
309 469 571†
407†

Other Courses:

315 435 595
331 589 601
333 590 627
337

†Courses which appear in more than one category.

Junior Courses

Note: Philosophy 201, 249, 275 and 279 have no prerequisites and may be taken in any order, save that 275 is not open to students with credit in 279.

Philosophy 201 **H(3-1T)**

Problems of Philosophy

Provides an introduction to philosophy through the discussion of selected topics such as skepticism, perception, personal identity, free will and determinism, God.

Philosophy 249 **H(3-1T)**

Ethics

A first enquiry into the nature and justification of moral standards.

Philosophy 275 **H(3-1T)**

Introductory Logic

An introduction to deductive and inductive techniques used in appraising arguments. The course will contain some elementary formal logic, but its main focus will be on analysing arguments as they occur in everyday life and ordinary language. An alternative to Philosophy 279.

Note: Not open to students with credit in Philosophy 279 or 377.

Philosophy 279 **H(3-1T)**

Logic I

Sentential and first-order logic from both deductive and semantic points of view. Some elementary metatheorems.

Note: Not open to students with credit in Philosophy 377.

Senior Courses

Note: Senior Courses will not necessarily be taught in every academic year, but will be available in accordance with student requirements and the availability of staff. The Department will normally offer two of Philosophy 301, 303, 305 each academic year.

Philosophy 301 **H(3-0)**

The Classical Period

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from the Pre-Socratics, through Plato and Aristotle, to the Hellenistic and Roman philosophers will be discussed.

Philosophy 303 **H(3-0)**

The Medieval and Renaissance Period

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from Augustine to Montaigne, such as Boethius, Abelard, Ibn Rushd, Maimonides, Aquinas, Ockham, and Erasmus will be discussed.

Philosophy 305 **H(3-0)**

The Seventeenth and Eighteenth Centuries

An introduction to Philosophy through the study of a period in its history. A selection of philosophers from Descartes to Kant will be discussed.

Philosophy 307 **H(3-0)**

Analytical Philosophy

An introductory survey of some of the fundamental concepts and techniques of contemporary philosophical analysis. Topics to be discussed will include: definition, meaning and reference, the analytic-synthetic distinction, the nature of philosophical analysis.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 309 **H(3-0)**

Current Topics in Philosophy

An intensive examination of a topic of current interest in philosophy. In years when the course is offered a course outline giving the topic to be treated will be available from the department office. The topic will also be announced in the Timetable.

Prerequisite: A previous course in Philosophy or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 313 **H(3-0)**

Bioethics

A critical and analytical examination of ethical and legal problems arising in and about health care. Issues to be considered may include euthanasia, abortion, the conditions for the withdrawal of treatment, the physician-patient relationship, research on human subjects, genetic engineering. The practical applications of ethical and legal theory are emphasized. Students with a background or special interest in the biological and medical sciences, health care, or medical jurisprudence may find this course particularly helpful.

Philosophy 315 **H(3-0)**

Philosophy in Literature

This course is designed to acquaint the student with various philosophical problems, theories and points of view as these find expression in works of literature from classical times to the present. Authors to be studied may range from Homer to Orwell and Huxley. In years when the course is offered a course outline giving authors and aspects of philosophy to be treated will be available from the Department office.

Philosophy 319 **H(3-0)**

Law and Philosophy

An investigation of philosophical accounts of the nature of law and legal systems. For intending law students and for undergraduates who want to increase their understanding of the character and role of law in a society. Acquaints the student with central positions in jurisprudence, such as natural law theories, legal realism, legal positivism, and relations between law and morality.

Philosophy 321 **H(3-0)**

Metaphysics

An examination of such topics as categories, existence, persons, space, time, necessity.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 329 **H(3-0)**

Business Ethics

A critical and analytical examination of some central moral problems that arise in and for business. Emphasis throughout the course will be placed not only on the details of the particular problems studied but also on the conceptual and other tools needed to understand and resolve or solve such problems. Topics to be discussed will include the moral responsibilities and rights of corporations and their officers, codes of business ethics, and conflicts of responsibilities and rights.

Philosophy 331 **H(3-0)**

Philosophy of Religion

A philosophical examination of the fundamental concepts of religious thinking.

Prerequisite: Religious Studies 205 or a previous course in Philosophy or consent of the Department.

Philosophy 333 **H(3-0)**

Aesthetics

An examination of the criteria and concepts employed in aesthetic evaluation.

Philosophy 337 **H(3-0)**

Feminist Philosophy

Issues in feminist philosophy and methodology. Topics may include feminist theories of knowledge and science, ethics, metaphysics, political theory and feminist methodology.

Philosophy 343 **H(3-0)**

Plato

A study of the writings of Plato.

Prerequisite: A previous course in the History of Philosophy or consent of the Department.

Philosophy 347 **H(3-0)**

Contemporary Moral Problems

A critical and analytical examination of some current moral issues. Topics to be investigated may include: authority, religion in society, suicide, sexual morality, abortion, the legal enforcement of morality, justice.

Philosophy 349 **H(3-0)**

Contemporary Ethical Theories

A detailed investigation of some central normative ethical theories, including utilitarian, contractarian, and deontological theories.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 355 **H(3-0)**

Hume

A study of the writings of Hume.

Prerequisite: A previous course in the History of Philosophy or consent of the Department.

Philosophy 363 **H(3-0)**

Epistemology

A study of some of the central problems in epistemology, including the following: knowledge and belief, empirical (perceptual and inductive) knowledge, a priori knowledge, appearance and reality, truth, scepticism.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 367 **H(3-0)**

Science and Philosophy

For students in any discipline who would like to understand some of the fundamental principles of scientific enquiry. Topics will include scientific explanation, theory, prediction and confirmation.

Philosophy 369 **H(3-0)**

Nineteenth Century European Philosophy

A study of the major currents in nineteenth-century philosophy. Central figures in this tradition include Fichte, Schelling, Hegel, Feuerbach, Marx, Kierkegaard, Schopenhauer and Nietzsche. The particular works and authors studied will vary from year to year.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 377 **H(3-1T)**

Elementary Formal Logic

Sentential and first-order logic, with identity and descriptions, from both deductive and semantic points of view. Completeness, compactness, decidability for sentential logic.

Note: Not open to students with credit in Philosophy 279.

Philosophy 379 **H(3-0)**

Logic II

Introduction to the metatheory of logical systems. Completeness, compactness, Löwenheim-Skolem, and undecidability theorems for first-order logic. Preview of non-standard models, second-order logic, and Gödel's first incompleteness theorem.

Prerequisite: Philosophy 279 or 377 or consent of the Department.

Philosophy 381 **H(3-0)**

Philosophy of Mind

A study of topics such as: thought, emotions, action and the will, mind-body identity, personal identity, and theories about the nature of mind.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 399 **H(3-0)**

Topics in Philosophy

A detailed examination of a topic or tradition in European or Anglo-American philosophy. In years when the course is being offered a detailed course outline giving the topic or tradition to be discussed will be available.

MAY BE REPEATED FOR CREDIT

Philosophy 405 **H(3-0)**

Early Modern Authors

A study of the writings of a seventeenth or eighteenth century philosopher other than Hume or Kant. In years when the course is offered a course outline giving the author and aspects of his/her philosophy to be treated will be available from the department office.

Prerequisites: Two previous courses in Philosophy, one of which must be Philosophy 301, 303, or 305; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 407 **H(3-0)**

Twentieth Century Analytic Philosophy

A study of the writings of a selected set of twentieth century analytical philosophers, which may include authors such as Russell, Wittgenstein, Austin, Quine, Putnam, Kripke, Dummett, Davidson. In years when the course is offered a course outline giving the authors to be discussed will be available from the department office.

Prerequisites: Two previous courses in Philosophy at least one of which must be a 300 or higher level course, and the other of which must be either Philosophy 279 or 377; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 409 **H(3-0)**

Current Topics in Philosophy

An intensive study of a selected current topic in Philosophy

Prerequisites: Two previous courses in Philosophy, at least one of which is at the 300 level, or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 421 **H(3-0)**

Problems in Metaphysics

An intensive study of a selected problem in metaphysics.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 431 **H(3-0)**

Marx and Engels

A philosophical study of the methods and concepts in the writings of socialist thinkers, primarily Marx and Engels. Topics to be considered may include the dialectic, materialism, alienation, structure of a theory of society, and the philosophical source of these as applied to the writings of Marx and Engels.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course; or consent of the Department.

Philosophy 433 **H(3-0)**

The Socialist Tradition

A study of selected thinkers or topics in Marxist or socialist thought.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 435 **H(3-0)**

Topics in Aesthetics

An intensive study of a selected topic in Aesthetics.

Prerequisites: Two previous courses in Philosophy, at least one of which is at the 300 level, or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 443 **H(3-0)**

Aristotle

A study of the writings of Aristotle.

Prerequisite: At least one of Philosophy 301, 303, 305, 343; or consent of the Department.

Philosophy 445 **H(3-0)**

Aquinas

A study of the writings of St. Thomas Aquinas.

Prerequisites: Two previous courses in philosophy, one of which must be Philosophy 301 or 303 or 305; or consent of the Department.

Philosophy 447 **H(3-0)**

Issues in Environmental Ethics

A philosophical examination of selected issues concerning how human beings ought to conduct themselves in relation to other living species and the natural environment. Topics may include: obligations to future generations; animal liberation theories; population policy; pollution; the value of species diversity and species preservation; biocentric and holistic ethical theories of environment; ethical dimension of environmental policy formation.

Prerequisite: One of Philosophy 249, 313, 329, 347, 349 or consent of the Department.

Philosophy 449 **H(3-0)**

Contemporary Meta-Ethics

A study of recent theories about the meaning of moral terms, the nature of moral reasoning, and the relations between facts and values. Theories to be studied will include naturalism, intuitionism, emotivism, prescriptivism, and nihilism.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course, and one of which must be a moral philosophy course; or consent of the Department.

Philosophy 453 **H(3-0)**

Social and Political Philosophy

A study of some fundamental issues in social and political thought. Issues to be studied may include: rights, justice, authority, equality, freedom, democracy, property, liberalism, communitarianism.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course; or consent of the Department.

Philosophy 457 **H(3-0)**

Kant

A study of the writings of Kant.

Prerequisites: Two previous courses in philosophy, one of which must be Philosophy 301 or 303 or 305; or consent of the Department.

Philosophy 459 **H(3-0)**

Hegel

A study of the writings of Hegel.

Prerequisites: Two previous courses in philosophy, one of which must be Philosophy 301 or 303 or 305; or consent of the Department.

Philosophy 463 **H(3-0)**

Problems in Epistemology

An intensive study of a selected problem in epistemology.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 467 **H(3-0)**

Problems in the Philosophy of Science

An examination of the central methodological and foundational issues arising in the sciences.

Prerequisite: Philosophy 275 or 279 or 377 or consent of the Department.

Philosophy 469 **H(3-0)**

Twentieth-Century European Philosophy

A study of the major currents in twentieth-century philosophy. Central figures in this tradition include Husserl, Heidegger, Sartre, Merleau-Ponty, Adorno, Marcuse, Habermas, Foucault, Derrida, Kristeva and Irigaray. The particular works and authors studied will vary from year to year.

Prerequisites: Two previous courses in philosophy, one of which must be at the 300 level; or consent of the Department.

Philosophy 479 **H(3-0)**

Logic III

Advanced metatheory for logical systems. Gödel's incompleteness theorems, models of arithmetic, and definability.

Prerequisite: Philosophy 379 or consent of the Department.

Philosophy 481 **H(3-0)**

Problems in the Philosophy of Mind

An intensive study of a selected problem in the philosophy of mind.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 501 **H(3-0)**

Topics in Ancient Philosophy

Prerequisites: Two previous courses in philosophy, at least one of which must be a course in the History of Philosophy and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 503 **H(3-0)**

Topics in Medieval Philosophy

Prerequisites: Two previous courses in philosophy, at least one of which must be a course in the History of Philosophy and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 505 **H(3-0)**

Topics in Modern Philosophy

Prerequisites: Two previous courses in philosophy, at least one of which must be a course in the History of Philosophy and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 509 **H(3-0)**

Topics in Contemporary Analytic Philosophy

An intensive study of selected topics in contemporary analytic philosophy. In years when the course is offered, a course outline giving the topics to be discussed will be available from the department office.

Prerequisites: Two previous courses in Philosophy, at least one of which must be at the 400 level or above; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 513 **H(3-0)**

Modal Logic

Introduction to the logical analysis of modal and intensional language. Semantics and axiomatics of sentential and quantificational modal logics. Philosophical problems of reference and modality.

Prerequisite: Philosophy 279 or 377 or consent of the Department.

Philosophy 517 **H(3-0)**

Topics in the History and Philosophy of Science

Prerequisites: Two previous courses in Philosophy, one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 519 **H(3-0)**
(Linguistics 519)

Formal Semantics of Natural Language

Central issues in the logical semantics of natural language, focusing on topics such as quantification, scope, and the interpretation of pronouns.

Prerequisite: Philosophy 279 or 377 or consent of the Department. Philosophy 307 or 407 or Linguistics 319 recommended.

Note: Not open to students with credit in Linguistics 509.

Philosophy 525 **H(3-0)**

Advanced Topics in Philosophy of Law

An intensive examination of a selected topic in the philosophy of law. Possible topics include: principles of responsibility and criminal law, legal reasoning and legal theory, economic analyses of law, theory and principles of tort law, theory and principles of contract law, the authority of law.

Prerequisites: Two previous courses in Philosophy, one of which must be Philosophy 319, and one of which must be a 400 or higher level course; or consent of the Department. Philosophy 449 or 453 are strongly recommended.

MAY BE REPEATED FOR CREDIT

Philosophy 547 **H(3-0)**

Advanced Applied Ethics

An investigation of one or more issues in applied ethics using results from normative ethical theory and meta-ethical theory.

Prerequisites: Two previous courses in Philosophy, one of which must be either 348 or 349 or 449, and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 549 **H(3-0)**

Advanced Ethics

An intensive investigation of one or more issues in normative ethical theory or meta-ethics.

Prerequisites: Two previous courses in philosophy, one of which must be Philosophy 349 or Philosophy 449, and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 553 **H(3-0)**

Advanced Political Philosophy

An intensive investigation of one or more issues in political philosophy.

Prerequisites: Two previous courses in Philosophy, one of which must be either 353 or 453, and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 565 **H(3-0)**

Philosophical Topics in the Sciences

A study of philosophical issues arising in a particular area of science. Possible topics include philosophy of biology, philosophy of social sciences, and philosophy of physics. Consult Department for specific topic in a given semester.

Note: This course is intended for students who have already done advanced work either in philosophy or in one of the sciences.

MAY BE REPEATED FOR CREDIT

Philosophy 567 **H(3-0)**

Advanced Philosophy of Science

An intensive study of a methodological or foundational issue in the philosophy of science.

Prerequisites: Two previous courses in Philosophy, one of which must be either 367 or 467, and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 571 **H(3-0)**

Philosophy of Logic and Philosophy of Language

An intensive study of topics such as the following: meaning, reference, propositions, identity, entailment, speech acts, analyticity.

Prerequisites: Two previous courses in Philosophy, one of which must be either 279 or 377, and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 589 **H(3-0)**

Advanced Topics in Philosophy

Intensive examination of an issue which philosophers are currently exploring. The topic for a given session will be announced in the master timetable.

Prerequisites: Two previous courses in Philosophy, at least one of which must be at the 400 level or above; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 590

Honours Thesis

Prerequisite: Admission to the Honours program.

Philosophy 595 **H(3-0)**

Directed Reading

Directed reading for students in their third or fourth years. This course is intended primarily for Majors and Honours students, but is open to others.

Prerequisite: Consent of the Department.

Note: Students wishing to register in this course must first consult with the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

With the exception of Philosophy 590 and Philosophy 595, courses numbered 500-599 may be taken for credit in the Graduate program in Philosophy. Details of the specific topics to be taught in all 600-level courses in Philosophy will be announced in the Department brochure and, when possible, in the master timetable.

Philosophy 601 **H(3-0)**

Seminar in Selected Problems

MAY BE REPEATED FOR CREDIT

Philosophy 609 **H(3-0)**

Topics in the History of Philosophy

MAY BE REPEATED FOR CREDIT

Philosophy 621 **H(3-0)**

Topics in Metaphysics

MAY BE REPEATED FOR CREDIT

Philosophy 627 **H(3-0)**

Topics in the Philosophy of Religion

MAY BE REPEATED FOR CREDIT

Philosophy 649 **H(3-0)**

Topics in Ethics

MAY BE REPEATED FOR CREDIT

Philosophy 653 **H(3-0)**

Topics in Social and Political Philosophy

MAY BE REPEATED FOR CREDIT

Philosophy 663 **H(3-0)**

Topics in Epistemology

MAY BE REPEATED FOR CREDIT

Philosophy 667 **H(3-0)**

Topics in Philosophy of Science

MAY BE REPEATED FOR CREDIT

Philosophy 671 **H(3-0)**

Topics in Philosophical Logic and the Philosophy of Language

MAY BE REPEATED FOR CREDIT

Philosophy 679 **H(3-0)**

Topics in Logic

MAY BE REPEATED FOR CREDIT

Philosophy 681 **H(3-0)**

Topics in the Philosophy of Mind

MAY BE REPEATED FOR CREDIT

Philosophy 691 **H(3-0)**

Topics in Philosophical Analysis

MAY BE REPEATED FOR CREDIT

Physical Education PHED

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, Dance Education Activity/Theory, Kinesiology, Outdoor Pursuits, Outdoor Pursuits Activity/Theory, and Physical Education Activity/Theory.

Senior Courses

Physical Education 321 **H(1-3)**

Games I

Games and sports suited to the needs of children and youth in schools.

Prerequisites: Kinesiology 201 and 321.

Note: Open to Pedagogy Majors only.

Physical Education 333 **H(1-3)**

Gymnastics in Schools

Content, planning, and teaching methodology in school gymnastics.

Note: Open to Pedagogy Majors only.

Physical Education 349 **H(1-3)**

Activities in Alternative Environments

Fundamental principles of creating an effective learning environment in the school Physical Education Alternative Environments setting (K to Grade 12).

Note: Open to Pedagogy Majors only.

Physical Education 421 **H(1-3)**

Games II

Games and sports suited to the needs of children and youth in schools.

Prerequisite: Physical Education 321.

Note: Open to Pedagogy Majors only.

Physical Education 503 **H(3-0)**

Special Topics in Physical Education

An examination of selected special topics in human physical activity and related subjects.

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Physical Education 591 **H(0-4)**

Practicum

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Graduate Course

Physical Education 603 **H(3-0)**

Special Topics

Intensive study of selected topics in human physical activity and related subjects.

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Physical Education Activity/Theory PEAT

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, Dance Education Activity/Theory, Kinesiology, Outdoor Pursuits, Outdoor Pursuits Activity/Theory, and Physical Education.

Junior Courses

Physical Education Activity/Theory 219 E(0-2)

Volleyball I

Physical Education Activity/Theory 226 E(0-2)

Strength Training I

Muscular strength and endurance through resistance training.

Physical Education Activity/Theory 228 E(0-2)

Cardiovascular Training I

Physical Education Activity/Theory 229 E(0-2)

Diving I

Prerequisite: Students must be able to swim before taking this course.

Physical Education Activity/Theory 230 E(0-2)

Flexibility and Relaxation I

Prerequisite: Kinesiology 261.

Physical Education Activity/Theory 263 E(0-2)

Alpine Skiing I

Senior Courses

Physical Education Activity/Theory 319 E(0-2)

Volleyball II

Prerequisite: Physical Education Activity/Theory 219.

Physical Education Activity/Theory 329 E(0-2)

Diving II

Prerequisite: Physical Education Activity/Theory 229.

Physical Education Activity/Theory 363 Q(0-4)

Alpine Skiing II

Prerequisite: Physical Education Activity/Theory 263.

Physical Education Activity/Theory 501 E(0-2)

Special Topics in Physical Activity

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Physical Education Activity/Theory 503 Q(0-4)

Special Topics in Physical Activity

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Physics PHYS

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Department Head – R. B. Hicks

Note: For listings of related courses, see Applied Physics, Astronomy, Astrophysics, Medical Physics and Space Physics.

Students intending to register in any Physics course should read the relevant Faculty of Science Program section of this Calendar.

Some Physics courses offered during First Year and the first session of Second Year are composed of modules (M1 to M13 and L1 to L4, listed below); see course listings for Physics 211, 219, 221, 223, 259, 269, 319, 321, 323 below.

Modules for First Year and First Session Second Year Physics Courses

M1 Motion and Kinematics. Motion in one dimension, including displacement, velocity and acceleration; relative motion; graphical analysis of motion.

M2 Forces and Acceleration. Newton's laws of motion; vectors; statics with forces; vector kinematics; uniform circular motion and other curvilinear motion; non-inertial reference frames.

M3 Energy, Momentum and Torques. Work and energy; gravitational energy; conservation of mechanical energy; friction; systems of particles and momentum conservation; statics involving torques.

M4 Electric Forces and Circuits. Electric force, field, potential energy, potential, and potential gradient. Current, electromotive force, Ohm's law, meters, DC circuits, Kirchhoff's rules.

M5 Magnetic Forces. Magnetic field, force on a moving charge, flux, Faraday's law, Lenz's law; applications; magnetic force on a current; magnetic field of a current; magnetic materials; applications.

M6 Thermal Physics. Gas laws; kinetic theory of gases; temperature; internal energy; specific heat; energy transfer; laws of thermodynamics; PVT diagrams.

M7 Basic Optics. Reflection, refraction; real and virtual images; images as objects; mirrors; lenses; optical instruments; wave nature of light; interference.

M8 Harmonic Motion. Simple harmonic motion (SHM) and its representation using complex numbers; physical examples; superposition; differential equation for SHM and its solution; damped and forced harmonic oscillators; physical examples.

M9 Waves I. Equations for travelling and standing waves; waves in gases, fluids, solids, and on strings; acoustic waves; superposition; wave speed; intensity and intensity level; Doppler shift for sound waves; energy transfer by radiation.

M10 Waves II. Wave equation and its harmonic solutions; waves in gases, fluids, solids, and on strings; acoustic waves; superposition; group and phase velocity; energy transport by waves; reflection and transmission; complex impedance; normal modes.

M12 Rotational Motion. Rotational kinematics and dynamics; linear dynamics; applications of the centre-of-momentum frame.

M13 Electricity and Magnetism III: Topics Involving Calculus. Non-uniform electric fields: continuous charge distributions, potential difference, potential gradient; magnetic fields: law of Biot and Savart, Ampere's law, inductance; spherical and cylindrical capacitors; RL and RC circuits.

L1 Physics Laboratory I. Laboratory to accompany Physics 223. Experimental techniques, data collection, graphical analysis, and report writing, applied to experiments in mechanics, electromagnetism, fluid mechanics, and thermodynamics. Students will be required to choose 8 experiments from a list of experiments.

L2 Physics Laboratory II. Ten laboratory experiments to accompany Physics 321 and 323.

L4 Physics Laboratory IV. Ten laboratory experiments to accompany Physics 259 and 269. Five of these experiments (L4a) will be completed as part of Physics 269 and five (L4b) as part of Physics 259.

Physics 004 E(12 hours)

Module M4 Electric Forces and Circuits

Prerequisite: Consent of the Department.

Physics 005 E(12 hours)

Module M5 Magnetic Forces

Prerequisite: Consent of the Department.

Physics 006 E(12 hours)

Module M6 Thermal Physics

Prerequisite: Consent of the Department.

Physics 007 E(12 hours)

Module M7 Basic Optics

Prerequisite: Consent of the Department.

Physics 008 E(12 hours)

Module M8 Harmonic Motion

Prerequisite: Consent of the Department.

Physics 012 E(12 hours)

Module M12 Rotational Motion

Prerequisite: Consent of the Department.

Physics 013 E(12 hours)

Module M13 Electricity and Magnetism III: Topics Involving Calculus

Prerequisite: Consent of the Department.

Physics 020 Q(16 hours)

Physics Skills I

Use of laboratory tools such as electronic devices, oscilloscopes, and vacuum systems. The "Physics Dictionary" and other useful study tools.

Prerequisites: Physics 211 or 221, and 213 or 223 or 225; or 215 and 217; or 259 and 269.

NOT INCLUDED IN GPA

Physics 023 E(12 hours)

Module L1 Physics Laboratory I

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Physics 024 E(12 hours)

Module L2 Physics Laboratory II

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Physics 026 **E(12 hours)**

Module L4 Physics Laboratory IV

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Physics 030 **Q(16 hours)**

Data Analysis I

Acquisition and analysis of experimental data; computational techniques.

Prerequisite: Physics 315 or 323 or 355.

NOT INCLUDED IN GPA

Physics 031 **Q(16 hours)**

Data Analysis II

Continuation of Physics 030.

Prerequisite: Physics 030.

NOT INCLUDED IN GPA

Physics 041 **Q(16 hours)**

Computers in Physics II: Document Preparation

Preparation of reports, papers, and other documents using Tex and LaTex.

Prerequisite: Physics 315 or 323 or 355.

NOT INCLUDED IN GPA

Junior Courses

Physics 211 **H(4-2T)**

Mechanics

Modules M1, M2 and M3.

Prerequisite: Pure Mathematics 30 or Mathematics 30.

Note: Physics 30 is recommended as preparation for Physics 211.

Note: Credit for both Physics 211 and any of 205, 217, 221 or 231 will not be allowed.

Note: Not open to students with 70% or higher in Physics 30 and Pure Mathematics 30 (or Mathematics 30) and 60% or higher in Mathematics 31, except with special Departmental permission.

Note: Physics 211 and 221 differ in their prerequisites, but cover the same material and have the same examinations and tutorial quizzes. Physics 211 has an extra lecture hour per week to deal with certain topics from High School Physics and Mathematics 31.

Physics 221 **H(3-2T)**

Mechanics

Modules M1, M2 and M3.

Prerequisite: A grade of 70% or higher in Physics 30, 50% or higher in Mathematics 31, and 70% or higher in Pure Mathematics 30 or Mathematics 30.

Note: Credit for both Physics 221 and any of 205, 211, 217 or 231 will not be allowed.

Physics 223 **H(3-3)**

Introductory Electromagnetism, and Thermal Physics

Modules M4, M5, M6 and L1. Intended for students intending to major in BioSciences, Chemistry, Geology, or Geophysics.

Prerequisite: Physics 211 or 217 or 221.

Note: Credit for both Physics 223 and any of 207, 213 or 355 will not be allowed.

Physics 225 **H(3-1T-3**

Classical Physics

Rotational mechanics; simple harmonic motion; waves; fluids.

Prerequisites: Physics 211 or 217 or 221; Applied Mathematics 217 or Mathematics 249 or 251 or 261.

Note: Credit for both Physics 225 and any of Physics 321 or Modules M8, M10 or M12 will not be allowed.

Note: For students intending to major in Physics, Applied Physics, Astrophysics, or Chemical Physics.

Physics 259 **H(3-IT-3/2)**

Electricity and Magnetism (for students in Engineering)

Modules M4, M5, M13 and L4b. Electric charges and electric current; Ohm's Law, Kirchhoff's Laws, application to simple circuits; potential and capacitance. An introduction to electromagnetic induction; inductance; electromotive force; electrical properties of materials.

Prerequisite: Engineering 205.

Prerequisite or Corequisite: Applied Mathematics 219.

Senior Courses

Physics 301 **H(3-3)**

Modern Physics I

Relativistic kinematics; spacetime diagrams; relativistic energy and momentum conservation with applications to particle physics. Nuclear radiation and exponential decay. Probabilistic aspects of nuclear processes. Planck's blackbody radiation law. Elementary particle physics.

Prerequisites: Physics 211 or 221; 213 or 223; Mathematics 221 or 211.

Physics 319 **H(3-3T) or H(2-2T-3) or H(1-1T-6)**

Directed Study in Physics II

Three modules, subject to prerequisites and availability. At least one module must be from Modules M8, M10, M12 and M13.

Prerequisite: Consent of the Department.

Physics 321 **H(3-3T)**

Harmonic Motion,Waves, and Rotation

Modules M8, M10 and M12.

Prerequisites: Physics 211 or 217 or 221; Mathematics 221 or 211; and 253 or Applied Mathematics 219.

Note: Credit for both Physics 321 and any of Physics 225 or 311 or 313 or 317 or 363 will not be allowed.

Physics 323 **H(2-2T-3)**

Optics and Electromagnetism

Modules M7, M13 and L2.

Prerequisites: Physics 211 or 221, and 213 or 223; Applied Mathematics 217 or Mathematics 249 or 251 or 261.

Corequisite: Mathematics 253 or 263.

Note: Credit for both Physics 323 and any of Physics 209 or 311 or 313 or 355 will not be allowed.

Physics 325 **H(3-3)**

Modern Physics II

Origins of quantum mechanics, a historical perspective. Concepts of wave mechanics and applications: atoms, molecules, and solids. Kinetic theory of gases; distribution functions; statistics of quantum gases with applications.

Prerequisites: One of: (a) Physics 311, 313 and 315, (b) Physics 321 and 323, or (c) Physics 341, 355.

Note: Credit for both Physics 209 and 325 will not be allowed.

Physics 341 **H(3-1)**

Classical Mechanics I

Forced and damped harmonic oscillations with real and complex numbers; anharmonic oscillators; central force motion and scattering; non-inertial frames; 2- and 3-body problems; applications of linear differential equations and complex numbers.

Prerequisites: Physics 225 or 321; Mathematics 211 or 221; .

Prerequisite or Corequisite: Applied Mathematics 307 or Mathematics 253 or 263.

Physics 343 **H(3-0)**

Classical Mechanics II

Rotating frames of reference; general rotations of rigid bodies; moment of inertia tensor; eigenvalues and eigenvectors; Lagrangian and Hamiltonian mechanics; potential theory and tides; perturbation theory.

Prerequisites: Physics 341; Applied Mathematics 307 or Mathematics 253 or 263.

Physics 347 **H(3-0)**
(formerly Physics 447)

Thermodynamics

Laws of thermodynamics, absolute temperature, entropy, thermodynamic potentials, applications.

Prerequisites or Corequisites: Physics 217 or 223 or 315 or 325; Applied Mathematics 307 or 311 or Mathematics 349 or 351.

Note: Credit for both Physics 347 and Chemistry 371 will not be allowed.

Physics 355 **H(3-3)**

Electromagnetic Theory I

Electrostatics, DC circuits, calculation of magnetic intensity from currents, motion of charged particles in electric and magnetic fields, electromagnetic induction, transient effects in capacitors and inductors, electric and magnetic properties of materials.

Prerequisites: Physics 211 or 221; Applied Mathematics 219 or Mathematics253.

Note: Credit for both Physics 355 and 323 will not be allowed.

Physics 369 **H(3-3/2)**

Acoustics, Optics and Radiation (for students in Engineering)

Wave motion as applied to acoustics, geometric and physical optics, and radiant energy transfer. Traditional and modern applications.

Prerequisites: Applied Mathematics 217, 219, Physics 259.

Physics 443 **H(3-0)**

Quantum Mechanics I

Basic postulates of quantum mechanics. Mathematical formalism of the theory and its physical interpretation. Schrödinger's time-dependent and time-independent equations. Single particle in a potential field (square well, potential barrier, harmonic oscillator, Kronig-Penney, Coulomb) and rigid rotator. The applicability of these potentials to atomic, molecular, nuclear, and solid state physics will be indicated.

Prerequisites: Physics 325; 343 or 433.

Note: Credit for both Physics 443 and Chemistry 373 will not be allowed.

Physics 449 **H(3-0)**

Statistical Mechanics

An introduction to statistical mechanics with applications.

Prerequisite: Physics 347 or 447.

Physics 455 **H(3-0)**

Electromagnetic Theory II

Macroscopic Maxwell equations. Scalar and vector potentials. Energy and momentum in Maxwell's theory. Electrostatics and magnetostatics. Dielectric and magnetic properties of materials. Superconductors.

Prerequisites: Physics 313 or 323 or 355; Applied Mathematics 309 or Mathematics 353.

Prerequisite or Corequisite: Applied Mathematics 413.

Physics 457 **H(3-0)**
(formerly Physics 555)

Electromagnetic Theory III

Electromagnetic wave solutions to Maxwell_s equations, in vacuum and in insulating and conducting media. Waveguides. Electromagnetic radiation from accelerated charges. Relativistic formulation of electrodynamics.

Prerequisites: Physics 455; Applied Mathematics 413.

Physics 471 **H(3-3)**

Optics

Geometrical Optics: lenses, mirrors, and other basic optical components. Matrix Methods. Physical Optics: Interference, Diffraction, and Polarization. Fourier Optics. Modern Optics: Lasers and Fibre Optics.

Prerequisites: Physics 325, 455; Applied Mathematics 413.

Physics 491 **Q(1S-0)**

Undergraduate Seminar I

Attendance at weekly seminars and presentation of one seminar on current physics-related research areas based on literature research, plus a written report.

Prerequisites: Physics 325, 343, 455.

Physics 499 **H(1-3T)**

Problem-Solving in Physics

Solving problems that require methods from more than one area of physics. Problems may include physics of lasers, atoms and molecules, plasmas, rocket flight, fluids, and special relativity.

Prerequisites: Physics 343, 455, 449.

Prerequisite or Corequisite: Physics 443.

Physics 501 **H(3-0)**

The Theory of Relativity

Review of relativistic kinematics and its geometrical interpretation. Applications of relativistic kinematics. Four-vector formalism and tensors in Minkowski space with applications. Introduction to Riemannian geometry and tensors in curved spacetime. Einstein equation. Schwarzschild metric and applications.

Prerequisites: Physics 301 and one of Mathematics 353 or Applied Mathematics 309.

Physics 507 **H(3-0)**

Solid State Physics

Crystal structure. Classification of solids and their bonding. Fermi surface. Elastic, electric and magnetic properties of solids.

Prerequisites: Physics 443 or Chemistry 373; Physics 449, 455.

Physics 509 **H(3-0)**

Plasma Physics

Occurrence of plasmas in nature, single particle motion, plasmas as fluids, waves in plasmas, diffusion, resistivity, equilibrium and stability, kinetic theory of plasmas, non-linear effects.

Prerequisites: Physics 343 or 433; 455.

Physics 533 **H(3-0)**

Advanced Mathematical Methods of Physics

Hilbert space. Complete orthonormal sets of functions. Sturm-Liouville theory. Green functions. Integral equations.

Prerequisites: Physics 443 or Chemistry 373; Physics 455.

Physics 535 **H(3-3)**

Computational Methods in Physics

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).

Prerequisites: Physics 443 or Chemistry 373 and Physics 455. **Note:** A knowledge of a high level programming language (C, C++, Fortran or Pascal) is highly recommended.

Physics 543 **H(3-0)**

Quantum Mechanics II

Theory of angular momentum and applications, perturbation theory and applications. Identical particles. Introduction to relativistic wave equations.

Prerequisite: Physics 443 or Chemistry 373.

Physics 561 **H(2-1)**

Stable and Radioactive Isotope Studies, Fundamentals

A multidisciplinary course. Topics include nucleosynthesis, radioactive decay, isotope exchange phenomena, kinetic isotope effects, tracer techniques, molecular spectra and instrumentation.

Prerequisite: Consent of the Department.

Physics 571 **H(3-0)**

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.

Prerequisites: Physics 443, 455.

Note: Physics 449 is suggested but not required.

Physics 591 **Q(1S-0)**

Undergraduate Seminar II

Similar to Physics 491, but including literature research into the connection between, influence on, or role of Physics in other areas of academia or society.

Prerequisite: Physics 491.

Physics 597 **H(1-6)**
(formerly Physics 409)

Senior Laboratory

Selected advanced experiments. Where possible, students may choose those experiments most suited to their interests.

Prerequisites: Physics 325; Physics 355; and Applied Physics 407 or 507.

Physics 598 **F(0-6)**

Research in Physics

Research project in Physics.

Prerequisites: Physics 443, 449, 455 and consent of the Department.

Physics 599 **H(0-9)**

Independent Study

Each student will be assigned a project in consultation with a tutor. A written report and oral presentation are required.

Prerequisite: Consent of the Department.

Note: This course may be repeated once for credit.

Graduate Courses

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

Physics 603 **H(3-0)**

Experimental Methods of Physics

Instrumentation for physical experiments. General philosophy of experimentation; signal processes; signal processing methods; instrument design and control; data acquisition and storage; specific detection methods.

Physics 605 **H(3-0)**

Advanced Data Analysis

Methods of extraction of significant information from experimental data degraded by noise. Parametric and non-parametric statistical methods; curve fitting; spectral analysis; filtering, sampling, convolution and deconvolution techniques.

Physics 609 **H(3-0)**

Advanced Classical Mechanics

Variational principles, Lagrange's equations, Noether's theorem. Hamilton's equations and

canonical transformations. Hamilton-Jacobi theory, action-angle variables. Perturbation theory.

Note: It is expected that a student's background will include Physics 433 or equivalent.

Physics 611 **H(3-0)**

Statistical Physics

Classical and quantum ensemble theory applied to interacting systems: real gases, spin lattices, phase transitions. Kinetic theory: Boltzmann equation, transport processes, irreversible processes and fluctuations.

Note: It is expected that a student's background will include Physics 449 or equivalent.

Physics 613 **H(3-0)**

Electrodynamics

Interaction between charged particles and the electromagnetic field in relativistic formulation. Scattering and energy losses of charged particles. Radiation by charged particles.

Note: It is expected that a student's background will include Physics 501 and 555 or equivalents.

Physics 615 **H(3-0)**

Advanced Quantum Mechanics I

Basic formalism of the theory and its interpretation, symmetry generators. Scattering theory. Bound states. Charged particles in electric and magnetic fields. Approximation methods.

Note: It is expected that a student's background will include Physics 543 or equivalent.

Physics 617 **H(3-0)**

Advanced Quantum Mechanics II

Second quantized description of N-particle systems. Quantum theory of the electromagnetic field, coherent states. Relativistic quantum mechanics.

Note: It is expected that a student's background will include Physics 543 or equivalent.

Physics 629 **H(3-0)**

Gravitation

An introduction to Einstein's theory of gravitation. Applications to the solar system, black holes, and cosmology.

Note: It is expected that a student's background will include Physics 501 or equivalent.

Physics 663 **H(2-1)**
Geology 663 (formerly Geology 699.03)

Applications of Stable Isotopes

Applications in archaeology, biology, chemistry, engineering, geography, geology, medicine, meteorology, paleontology, physics and space sciences. Topics include hydrology, paleoclimates, ore deposits, geothermometry, fossil fuels exploration and recovery, pollutant tracing, food webs and forensic investigations.

Prerequisite: Consent of the Department.

Physics 671 **H(3-0)**

Atomic and Molecular Spectroscopy

Atomic structure and spectra. Rotational, vibrational and electronic spectra of diatomic molecules, including microwave, infrared, Raman and visible/ ultraviolet spectroscopic techniques. Hund's coupling cases. Polyatomic molecular spectroscopy. Examples from astronomy and upper atmosphere/ space physics.

Physics 673 **H(3-0)**

Non-Linear Optics and Quantum Electronics

Operating principles and capabilities of lasers. Theory and application of nonlinear optics and quantum electronics with possible examples including nonlinear mixing, optical parametric oscillators, stimulated Brillouin and Rayleigh Scattering, and electro-optic effects.

Physics 675 **H(3-0)**

Special Topics in Laser and Optical Sciences

Lectures by Physics and Astronomy, Chemistry, Engineering, and/or Medicine staff on current research topics in laser science and modern optical techniques.

MAY BE REPEATED FOR CREDIT

Physics 691 **H(2S-0)**

Graduate Seminar

Reports on studies of the literature or of current research. Required of all graduate students in the Department of Physics and Astronomy.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Physics 697 **H(3-0)**

Topics in Contemporary Physics

Topics will be from the research areas of staff members.

MAY BE REPEATED FOR CREDIT

Physics 699 **H(0-9)**

Project in Physics

Each student will select a project in consultation with a staff member. The project may be experimental or theoretical in nature. A written report and an oral presentation are required.

Physics 701 **H(0-9)**

Independent Study

Each student will select a topic of study in consultation with a staff member. The topic will be in the research area of the staff member. This course may not be used to meet the regular course requirements in the MSc and PhD programs.

MAY BE REPEATED FOR CREDIT

Political Science POLI

Instruction offered by members of the Department of Political Science in the Faculty of Social Sciences.

Department Head – R. C. Keith

Junior Courses

Political Science 201 **H(3-1T)**

Introduction to Government and Politics

A systematic introduction to the basic concepts and institutions of the process of politics.

Political Science 213 **H(3-0)**
(formerly Political Science 313)

Political Ideologies

An introduction to the study of political ideologies such as nationalism, socialism, liberalism and fascism.

Political Science 225 **H(3-0)**

Canadian Politics: A Comparative View

An introduction to the study of government and politics through the examination of current issues and trends in post-industrial nations, comparing Canada with Europe and Anglo-American democracies.

Political Science 279 **H(3-0)**
(formerly Political Science 379)

Politics of the Global South

An introduction to political issues common to the developing regions of Africa, Asia, Latin America and the Middle East, with special emphasis on topics such as democratization, globalization, development, and human rights.

Political Science 283 **H(3-0)**

Issues and Trends in World Politics

Major trends and issues in world politics, such as international tensions, migration, ethnic conflicts, human rights and sustainable development.

Senior Courses

In selecting Senior Courses and in designing their programs, students are advised to consult the Undergraduate Guide, available from the Department.

Political Science 309 **H(3-0)**

Rational Choice

Topics such as game theory, cooperation, collective action, public choice, coalitions and voting rules.

Political Science 310 **F(3-0)**

History of Political Thought

Focuses on the quest for the good regime in the West. The criteria for the good regime will be enunciated and applied to the Classical (Platonic, Aristotelian and Roman), the Medieval (Augustinian and Thomistic) Machiavellian, Liberal, Marxian and Utopian conceptions of the good regime.

Political Science 321 **H(3-1T)**

The Canadian State

The formal institutions of the Canadian state, including Parliament, the executive, federalism, the Constitution, and the courts. Emphasis on the way that political processes are shaped by these and other institutions. This course may have a special instructional format. Please consult the Department for details.

Political Science 323 **H(3-0)**

Politics of the North

An introduction to the political development of Canada's northern regions and the circumpolar world.

Political Science 325 **H(3-0)**

Federalism

Theoretical and empirical examination of federalism in Canada and other selected states.

Prerequisite: Political Science 321.

Political Science 327 **H(3-0)**

Feminist Political Theory

Examination of feminist political theories and ethical issues in gender politics.

Political Science 329 **H(3-0)**

Alberta and Provincial Politics

Alberta politics in the comparative context of Canadian provincial politics.

Political Science 343 **H(3-1T)**

Law, Politics, and the Judicial Process

The judicial system as a branch of government and as part of the political process. Focus on the Canadian judiciary within a comparative context.

Political Science 357 **H(3-0)**

Introduction to Public Policy Analysis

An introduction to themes and methods in public policy studies. The practical and normative problems facing governments in initiating, formulating, enacting, and implementing policy will be discussed. Case studies will be employed.

Prerequisite: Political Science 223 or 225 or 321; or consent of the Department.

Political Science 359 **H(3-0)**

Comparative Government and Politics

An introduction to the analytical concepts of the comparative approach to political analysis.

Note: The Department recommends this course precede Senior Courses taken in the field of Comparative Government.

Political Science 361 **H(3-0)**

Governments and Politics of Eastern Europe

Post-communist politics in eastern Europe, including the Baltic states and Ukraine. Concentration on transitions to democracy and relations with the European Union.

Political Science 363 **H(3-0)**

Governments and Politics of Western Europe

An introduction to the governments and politics of the states and societies of western Europe including the importance of their membership in the European Union.

Political Science 365 **H(3-0)**

Government and Politics of China

Politics of China in its social, economic, and ideological environment.

Political Science 369 **H(3-0)**

Governments and Politics of the Middle East

A survey and analysis of the organization and functioning of governments and politics of the contemporary Middle East, with emphasis on the social and economic environments which influence them.

Political Science 371 **H(3-0)**

Governments and Politics of Africa

Political institutions of selected African states. The influence of class and tribal structure; political parties; elections, the source and nature of ideologies; and economic and social policies.

Political Science 375 **H(3-0)**

Government and Politics of Russia

The collapse of the U.S.S.R. and Russia_s constitution, power struggles, elections, democracy, and marketization.

Political Science 377 **H(3-0)**

Government and Politics of the United States

A study of the institutions and processes of American politics.

Political Science 381 **H(3-0)**

Introduction to International Relations

The structures and processes of international relations and foreign policy.

Political Science 383 **H(3-0)**

Introduction to International Law

The basic concepts, principles, and functions of international law.

Prerequisite: Political Science 381 or consent of the department.

Political Science 385 **H(3-0)**

Introduction to International Organizations

An introductory analysis of international governmental organizations with main emphasis on the United Nations and selected regional organizations.

Prerequisite: Political Science 381 or consent of the department.

Political Science 387 **H(3-0)**
(Historical Studies 387)

Political History of Ireland from 1603

A study of modern Ireland from the English conquest of 1603 to the present. It will include a special emphasis on the origins of the contemporary Irish Republic and Northern Ireland.

Political Science 389 **H(3-0)**
(Historical Studies 389)

Government and Politics of Japan Since 1850

Political development of modern and contemporary Japan, and Japan's diplomatic relations with its Asia-Pacific neighbours.

Note: Not open to students with credit in Political Science 367.

Political Science 391 **H(3-0)**
(Historical Studies 391)

Modern Latin American Politics and Society

A political history of modern and contemporary Latin America. Themes may include populism, revolution, militarism, new social movements, and democratization.

Note: Not open to students with credit in Political Science 373.

Political Science 399 **H(3-1T)**

Research Methods

Research design, measurement, data collection, and data analysis.

Prerequisite: One half course at the 200 level in Political Science or consent of the Department.

Note: Credit towards degree requirements will be given for only one of Anthropology 307, Applied Psychology 301/303, Engineering 319, Political Science 399, Psychology 312, Sociology 311/315, Statistics 201/211, 213/217, 333, 357; that one being a course appropriate to the degree program.

All courses numbered 401-597 inclusive are generally offered in alternate years. Please consult the master timetable.

Political Science 401 **H(3-0)**

Property and Justice

Ethical reflections on theories of property in their political context. Focus on Augustine, Aquinas and contemporary Christian views.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 405 **H(3-0)**

Biopolitics

Biological and cultural origins of political behaviour. Topics such as altruism, reciprocity, sex differences, aggression, and emergence of the state.

Political Science 407 **H(3-0)**

Classical Political Thought

An examination of selected classical texts from historians, dramatists and political philosophers with special focus upon the concepts relevant to political problems in the twentieth century.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 409 **H(3-0)**

Liberalism and Conservatism

Liberal and conservative writers such as J.S. Mill and Edmund Burke. Contemporary developments in neoliberalism and neoconservatism.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 411 **H(3-0)**

Recent Political Thought

A study of selected twentieth-century political thinkers and their critics. Consult the department for information on the selection of topics.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 413 **H(3-0)**

Politics and Literature

Political analysis of how selected works of literature articulate visions of order and disorder.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 423 **H(3-0)**

Politics of the Canadian North

The evolution of government and politics in Canada's Territories.

Political Science 425 **H(3-0)**

Local Government

A study of both institutions and political processes at the local level.

Prerequisite: Political Science 321 or consent of the Department.

Political Science 429 **H(3-0)**

Electoral Behaviour

An examination of individual and group influences on public opinion, citizen participation and electoral choice. A portion of the course will require quantitative analysis. Computer use is required.

Prerequisite: Political Science 399 or consent of the Department.

Political Science 431 **H(3-0)**

Political Parties and Interest Groups

Political representation of territorial, linguistic, gender and class interests in the decision-making process.

Prerequisite: Political Science 321 or consent of the Department.

Political Science 435 **H(3-0)**

Canada and World Politics

An analysis and evaluation of Canada's role on the international scene; main objectives of Canadian foreign policy; security and defence policies; Canada's participation in universal international organizations; the influence of Canada as a middle power upon world events.

Prerequisites: Political Science 381 or consent of the Department.

Political Science 437 **H(3-0)**

Canada-United States Relations

Roles of the respective governments in the various facets (political, strategic, economic, and socio-cultural) of the relationship between the two countries will be examined.

Prerequisites: Political Science 381 or consent of the Department.

Political Science 439 **H(3-0)**

Strategic Studies

An analysis of the causes of war, the meaning of security and defence in the post-Cold War era, including the use and control of military force.

Prerequisite: Political Science 381 or consent of the department.

Political Science 441 **H(3-0)**
(Religious Studies 441)

Millenarian Movements

A study of religious and political millenarianism. Persons such as Louis Riel, Thomas Muntzer, Karl Marx, and William Aberhart. Movements such as cargo cults, nativism, Seventh-Day Adventists, Jehovah's Witnesses, and Nichiren Shoshu Buddhism.

Prerequisite: Religious Studies 341 or Political Science 310 or consent of the Department.

Political Science 442 **F(3-0)**

Constitutional Law and Politics

The interaction of constitutional law and politics, with special emphasis on judicial review of federalism and entrenched rights. Focus on Canada within a comparative context.

Prerequisites: Political Science 321 and 343 or consent of Department.

Political Science 447 **H(3-0)**

Public Policy Issues

Case studies of selected public policies. Emphasis on Canada, with comparative examples.

Prerequisite: Political Science 357.

Political Science 451 **H(3-0)**

Public Administration

Theories of public administration and their practical application in Canada and selected countries.

Prerequisite: Political Science 321 or consent of the Department.

Political Science 461 **H(3-0)**

Post-Soviet Politics

The interplay between nationalism, domestic politics, and foreign policy in the successor states of the former U.S.S.R.

Political Science 463 **H(3-0)**

Politics of Advanced Industrial States

Comparative analysis of the political dynamics of advanced industrial states. Focus on problems associated with advanced industrialization and on explanations for political stability and change.

Prerequisite: Political Science 359.

Political Science 465 **H(3-0)**

The Politics of Development in China

Chinese Communist leadership and policy disputes from the 1940s to the present with focus on alternative strategies for development.

Political Science 467 **H(3-0)**

Japan: Contemporary Political Problems

In-depth analysis of selected problems with emphasis on Japan's politics and its diplomatic relations with its Asia Pacific neighbours.

Prerequisite: Political Science 389 (Historical Studies 389) or consent of the Department.

Political Science 469 **H(3-0)**

Middle East: Contemporary Political Problems

An in-depth analysis of selected political, economic and social problems and issues affecting individual nations and the area in general.

Prerequisite: Political Science 369 or consent of the Department.

Political Science 471 **H(3-0)**

Africa: Contemporary Political Problems

An analysis of political problems in selected political systems of Africa. Topics will include the politics of rural development, political elites and the state in Africa, political institutions, constraints on development, and urban politics.

Prerequisite: Political Science 371 or 379 or African Studies 301; or consent of the Department.

Political Science 473 **H(3-0)**

Latin America: Contemporary Political Problems

An analysis of political problems in selected political systems of Latin America. Topics examined will include political elites, ideologies, political institutions, political socialization and political change.

Prerequisite: Political Science 359 or consent of the Department.

Political Science 475 **H(3-0)**

International Relations of the Asia Pacific

In-depth analysis of selected problems in security and economic relations of Asia Pacific countries, including Canada, U.S., Japan, Russia, PRC, Taiwan, North and South Korea, and ASEAN countries.

Prerequisite: Political Science 381 or consent of the Department.

Political Science 479 **H(3-0)**

International Relations of the Contemporary Arab World

An examination of the Arab regional system, with emphasis on regional interaction, regional organizations, and external linkages. The specific cultural, political, ideological, and strategic characteristics of the system will be analysed.

Prerequisite: Political Science 369 or consent of the Department.

Political Science 485 **H(3-0)**

The Politics of the International Economic Order

Analysis of the political management of international economic relations. Topics may include the politics of trade and money relations, energy, multinational corporations, and the New International Economic Order.

Prerequisite: Political Science 381 or consent of the Department.

Political Science 489 **H(3-0)**

Foreign Policies of Major Powers

An analysis and evaluation of the foreign policies of selected major powers, such as the United States, Russia, etc.

Prerequisite: Political Science 381 or consent of the department.

Political Science 493 **H(3-0)**

Theories of International Relations

Moral issues in international relations, such as justice and the legitimacy of aggression and intervention in the affairs of foreign states. The course may involve a simulation

Prerequisite: Political Science 381 or consent of the Department.

Political Science 499 **H(3-0)**

Honours Seminar

Classic works in the subfields of political science. Normally required of Honours students in the second half of their third year, and open to others with the consent of the Department.

Political Science 500 **F(3-0)**

Honours Thesis

For students in the last year of their Honours program.

Political Science 501 **H(3-0)**

Independent Research

Fourth-year Political Science Majors will select research topics in one of the following fields: political theory; Canadian politics; comparative politics; international relations; public policy, law, and administration.

Prerequisite: Consult the Department for assignment to a faculty supervisor.

Note: Not open to students with credit in Political Science 500.

Political Science 503 **H(3-0)**

Selected Topics in Political Theory

Content of the course will vary from year to year. Consult the Department for information on choice of topics.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 521 **H(3S-0)**

Canadian Executive Federalism

Preparation for and participation in a model First Ministers' Conference.

Prerequisite: Consent of the Department.

Political Science 541 **H(3-0)**

Selected Topics in Public Law

An examination of the political, philosophical, and institutional dimensions of selected public law issues. Civil liberties issues will be emphasized, but other questions may also be studied. Consult the Department for information on choice of topics.

Prerequisite: Political Science 343 or 442.

Political Science 551 **H(3-0)**
(Historical Studies 551)

Women in 20th Century Canadian Politics

A political history of women in Canada in the 20th century. Topics include campaigns for suffrage, legal personhood and equality rights, women's political activism, the evolution of public policy concerning women, and the participation of women in public life.

Prerequisite: Political Science 321 or Historical Studies 343, or consent of the Department.

Political Science 561 **H(3S-0)**

Government and Politics of the European Union

Preparation and participation in a model European Council Meeting.

Prerequisite: Consent of the Department.

Political Science 567 **H(3-0)**
(Historical Studies 567)

United States Constitutional History

History of constitutionalism in the U.S. from colonial times to the present. The process of constitutional development through judicial interpretation of the basic law.

Political Science 569 **H(3S-0)**

Selected Topics in Middle East Politics

Emphasis will be on foreign-policy development and application in the Middle East.

Prerequisites: Political Science 369 and one 400-level course in comparative politics or international relations, or consent of the Department.

Political Science 577 **H(3S-0)**

Government and Politics of the United States

Domestic political issues in American politics including political parties, courts, Congressional-Presidential relations, and budgetary, fiscal and social relations. May be offered as a simulation.

Prerequisite: Political Science 377.

Political Science 579 **H(3-0)**

Political Economy of Development

Third World development projects, programs, and policies in Africa, Asia and Latin America, intended to raise the standard of living and enhance political participation.

Prerequisite: Political Science 379 or consent of the Department.

Political Science 581 **H(3S-0)**

Selected Topics in International Law and Organizations

An advanced seminar on international order and on cooperative and competitive efforts by states and other international actors to create, maintain and change that order.

Prerequisite: Political Science 383 or 385 or consent of the Department.

Political Science 583 **H(3-0)**
(Historical Studies 583)

The United States and the World since 1890

A historical and analytical examination of the development of modern United States foreign policy from the late nineteenth century to the present. Topics include the institutional structure of foreign policy decision-making, including the role of the President, Congress, State Department, Pentagon and public opinion, and the relationship between domestic politics and foreign policy. Historical dimensions include the turn to imperialism, World War I, the coming of World War II, the Cold War, Korea, Vietnam, Latin American relations, strategic arms limitations talks, and detente.

Prerequisites: Third or fourth year standing and one of History 219 or 383, Political Science 381 or consent of the Department.

Political Science 597 **H(3-0)**

Directed Readings in Political Science

Students wishing to register in this course must submit to the Head of the Department a detailed statement by the instructor of the work to be carried out.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Courses numbered 600-799 are offered either as special reading courses or as seminars, as required. Students should consult the Department regarding enrollment in these courses.

Political Science 615 **H(3-0)**

Advanced History of Political Thought

Intensive study of major political thinkers.

Political Science 617 **H(3-0)**

Advanced Political Theory

Discussion of contemporary topics in political thought. Emphasis on analysis of problems rather than history of ideas.

Political Science 619 **H(3-0)**

Applied Ethics and Military Force

An examination of the philosophical justifications offered to defend the use of military force, based particularly on the analysis of texts in the history of Western political philosophy.

Political Science 621 **H(3-0)**

Canadian Federal Politics

Examination of the structure and operation of the Canadian federal state including its constitutional framework, parliamentary government, intergovernmental relations, and political culture.

Political Science 623 **H(3-0)**

Canadian Political Process

Examination of Canadian political behaviour within its institutional context, including political parties, interest groups, voting and socialization. Computer use is optional.

Political Science 625 **H(3-0)**

Canadian Public Administration

Examination of the problems of administrative agencies and public authorities.

Political Science 641 **H(3-0)**

Selected Topics in Public Law

Examination of the political, philosophical, and institutional dimensions of selected public law issues, with particular reference to judicial and quasi-judicial tribunals as policy-making institutions. Consult the Department for information on choice of topics.

Political Science 651 **H(3-0)**

Policy Studies

Critical review of major themes, issues, and approaches in the study and evaluation of public policy.

Political Science 671 **H(3-0)**

Advanced Comparative Politics: Political Development

Analysis of comparative methods and paradigms of political development.

Political Science 673 **H(3-0)**

Advanced Comparative Politics: Institutions and Systems

Comparative analysis of political institutions and systems.

Political Science 675 **H(3-0)**

Selected Topics in Advanced Comparative Politics

675.01. Middle East

675.02. Africa

675.03. East Asia

675.04. Latin America

675.05. Western Europe

675.06. Eastern Europe and the Former Soviet Union

675.07. Public Policy

675.08. Politics of Development

Political Science 681 **H(3-0)**

Advanced Analysis of International Relations

Selected issues and approaches in the analysis of world politics.

Political Science 683 **H(3-0)**

Advanced Studies in Foreign Policy

Selected themes in the formation and implementation of foreign policies.

Political Science 685 **H(3-0)**

Strategic Studies

Advanced seminar in major topics in strategic studies, such as arms control, deterrence, and other military doctrines.

Political Science 687 **H(3-0)**

Mass Violence and Human Rights

An examination of the political, ethical and legal dilemmas surrounding collective violence and its impact on populations in the context of Post-Cold War case histories.

Political Science 691 **H(3-0)**

Quantitative Analysis in Political Science

Examination of empirical research methods and techniques of quantitative analysis in the study of political phenomena. Computer use is required.

Political Science 693 **H(3-0)**

Theoretical Foundations of Political Science

Political Science 715 **H(3-0)**

Special Topics in Political Theory

MAY BE REPEATED FOR CREDIT

Political Science 721 **H(3-0)**

Special Topics in Canadian Politics

MAY BE REPEATED FOR CREDIT

Political Science 725 **H(3-0)**

Special Topics in Public Administration

MAY BE REPEATED FOR CREDIT

Political Science 741 **H(3-0)**

Special Topics in Public Law

MAY BE REPEATED FOR CREDIT

Political Science 751 **H(3-0)**

Public Policy Case Study I

Political Science 753 **H(3-0)**

Public Policy Case Study II

Prerequisite: Political Science 751.

Political Science 755 **H(3-0)**

Special Topics in Public Policy

MAY BE REPEATED FOR CREDIT

Political Science 781 **H(3-0)**

Special Topics in International Relations

MAY BE REPEATED FOR CREDIT

Each year, depending on the needs of students, a number of 600- and 700-level Graduate Courses are offered from the foregoing list. In addition to the numbered and titled courses shown above, the Department offers a selection of advanced level Graduate Courses specifically designed to meet the needs of individuals or small groups of students. These courses are numbered in the series 800.01 to 899.99. Such offerings are, however, contingent upon the availability of staff resources.

Psychology PSYC

Instruction offered by members of the Department of Psychology in the Faculty of Social Sciences.

Department Head – B. H. Bland

Exceptions to listed prerequisites will be considered through application to the Department of Psychology.

Note: Only Psychology courses may be used to fulfill the requirements for the Major or Minor in Psychology.

Junior Courses

Psychology 205 **H(3-0)(Area II)**

Principles of Psychology

Fundamental procedures, findings, terminology and theories in the major areas of psychology.

Note: This course is a prerequisite for all psychology courses except Psychology 305.

Psychology 209 **H(3-0)(Area II)**

Critical Issues in Psychology

Required readings and written assignments will explore fundamental controversies in Psychology such as nature and nurture explanations of intelligence; determinism versus free will views of personality; ethical issues in research and therapy.

Prerequisite: Psychology 205.

Senior Courses

Psychology 305 **H(3-0)(Area II)**

History of Psychological Thought

The roots of psychological thought in Western culture, and the relationship between theories of human nature and changing social institutions.

Psychology 312 **F(3-2)(Area III)**

Experimental Design and Quantitative Methods for Psychology

An integrated approach to the methods, principles, and ethics of psychological research and the statistical techniques utilized for the analysis of these data.

Prerequisites: Mathematics 30 or 31 or Pure Mathematics 30, and Psychology 205 or equivalents.

Note: This course serves as a prerequisite for many senior psychology courses.

Note: Credit towards degree requirements will be given for only one of Anthropology 307, Applied Psychology 301/303, Engineering 319, Political Science 399, Psychology 312, Sociology 311/315, Statistics 201/211, 213/217, 333, 357; that one being a course appropriate to the degree program.

Psychology 331 **H(3-1T)(Area II)**

Tests and Individual Differences

Individual differences and psychological testing including the description, use, evaluation and development of typical tests, as well as discussion of important issues in human differences.

Prerequisite: Psychology 205 or equivalent.

Psychology 345 **H(3-0)(Area II)**

Social Psychology

Social psychological approaches to understanding social influence, social perception and cognition, attitudes and group dynamics.

Prerequisite: Psychology 205 or equivalent.

Note: Not open to students with credit in Psychology 445 or Sociology 341.

Psychology 347 **H(3-0)(Area II)**

Psychology of Gender

An overview of psychological perspectives on gender, including the nature of gender, the origin of gender stereotypes, the question of similarities and differences, and the implications of gender for interpersonal relationships and other facets of social life.

Prerequisite: Psychology 205.

Psychology 351 **H(3-0)(Area II)**

Developmental Psychology

Psychological development through childhood.

Prerequisite: Psychology 205 or equivalent.

Note: Not open to students with credit in Applied Psychology 311.

Psychology 353 **H(3-0)(Area II)**

Psychology of Aging

Introduction to adult development and aging with an emphasis on sensory and perceptual processes, memory and cognition, intelligence, mental health, social relations, work, death and dying. Provides a background for advanced courses in adult development and aging.

Prerequisite: Psychology 205 or equivalent.

Psychology 355 **H(3-0)(Area II)**

Adolescence

Interaction of physical, cognitive, emotional, and social changes occurring during adolescence.

Prerequisite: Psychology 205 or equivalent.

Note: Not open to students with credit in Applied Psychology 313.

Psychology 359 **H(3-0)(Area II)**

Abnormal Child Psychology

An overview of the theories, causes, and treatments for major forms of abnormal development in childhood and adolescence including behaviour disorders, emotional disorders, developmental and learning problems, and problems related to physical and mental health.

Prerequisite: Psychology 205 or equivalent.

Note: Not open to students with credit in Applied Psychology 565.

Psychology 365 **H(3-0)(Area III)**

Cognitive Psychology

A survey of research and theory in cognitive psychology. Research in pattern recognition, attention, memory, language, thinking, and other cognitive abilities is explored, with discussion of associated brain mechanisms.

Prerequisite: Psychology 205.

Note: Not open to students with credit in Applied Psychology 411.

Psychology 369 **H(3-0)(Area III)**

Sensation and Perception

The psychological and physiological bases of sensory and perceptual processes, including vision, audition, taste, smell, touch, proprioception, and basic psychophysics. Provides a background for advanced courses in sensory and perceptual processing, human factors, and environmental psychology.

Prerequisite: Psychology 205 or equivalent.

Note: Not open to students with credit in Psychology 469 or Psychology 471.

Psychology 375 **H(3-0)(Area III)**

Brain and Behaviour

The neural basis of learning, memory, language and thinking, as well as pathological, sexual, aggressive, and emotional behaviour that arises from neural and hormonal malfunctioning.

Prerequisite: Psychology 205 or equivalent.

Note: Not open to students with credit in Psychology 371, 475, 476, or 479.

Psychology 377 **H(3-0)(Area III)**

Evolutionary Psychology

An examination of the scientific synthesis of evolutionary biology and modern psychology, which offers a novel approach to such issues as short-term and long-term human mating strategies, short-term sexual strategies, conflict between the sexes, parental investment, aggression, and social dominance.

Prerequisite: Psychology 205 or equivalent.

Psychology 383 **H(3-0)(Area II)**

Personality

Approaches to the study of personality.

Prerequisite: Psychology 205 or equivalent.

Psychology 385 **H(3-0)(Area II)**

Introduction to Abnormal Psychology

Abnormal behaviour and experiences, their causes and treatment.

Prerequisite: Psychology 205 or equivalent.

Psychology 405 **H(3-0)(Area II)**

Contemporary Theories in Psychology

An analysis of what constitutes a "theory," "model" and "explanation" in psychology as a science. Survey of major theoretical positions in twentieth century psychology.

Prerequisites: Psychology 205 or equivalent and one senior half course in Psychology.

Psychology 407 **H(3-2)(Area III)**

Psychometrics

Theory and application of methodological and statistical issues in psychological assessment. Topics include: theories of psychological measurement, scale development, item analysis, item bias, reliability, validity, and test fairness.

Prerequisite: Psychology 312.

Note: Not open to students with credit in Applied Psychology 307.

Psychology 411 **H(3-2)(Area III)**

Design and Analysis in Psychological Research

Experimental design problems and techniques for analysis of psychological data.

Prerequisite: Psychology 312.

Psychology 415 **H(3-2)(Area II)**
(formerly Psychology 413)

Nonexperimental Research Methods in Psychology

Examination of various non-experimental and qualitative approaches to creating psychological knowledge including questionnaire construction and use, observational techniques, and research interviewing.

Prerequisite: Psychology 312.

Psychology 421 **H(3-0)(Area II)**

Personnel Psychology in Industry

Application of psychological principles to the understanding of personnel systems including job performance criteria, selection, training and development, and performance appraisal.

Prerequisite: Psychology 312.

Psychology 423 **H(3-0)(Area II)**

Organizational Psychology

Understanding human behaviour within an organizational setting. Topics normally include: organizational structure, context, climate, communication, decision-making, motivation, work groups, change and development.

Prerequisite: Psychology 312.

Psychology 425 **H(3-2)(Area III)**

Human Factors

Application of psychological research and theory to people-system relationships and the work environment; display and control devices, design and evaluation of the built environment, human skills and limitations, work schedules, safety, and research methods in human factors engineering.

Prerequisite: Psychology 312.

Psychology 427 **H(3-2)(Area III)**

Environmental Psychology

The theory and data pertaining to the relationship between human behaviour and the physical environment, both natural and built. Particular emphasis is placed on the implications of current knowledge for the management of the human-environment interface. A research project is an integral part of the course.

Prerequisite: Psychology 312.

Psychology 431 **H(3-0)(Area II)**
(formerly Psychology 481)

Current Issues in Psychopathology

Coverage of the theoretical and methodological aspects of current research into the etiology and modification of behavioural and experiential disorders.

Prerequisites: Psychology 312 and 385.

Psychology 433 **H(3-2)(Area II)**
(formerly Psychology 483)

Clinical Psychology

Assessment and treatment problems in clinical settings.

Prerequisite: Psychology 385. Psychology 331 is recommended.

Note: Restricted to fourth-year Psychology Majors and fourth-year Psychology Honours students.

Psychology 435 **H(3-2)(Area II)**
(formerly Psychology 485)

Behaviour Modification

Current behaviour change procedures for children and adults. Practical considerations involved in the selection, implementation, maintenance, and evaluation of behaviour modification programs.

Prerequisite: Psychology 385.

Note: Restricted to fourth-year Psychology Majors and fourth-year Psychology Honours students.

Psychology 437 **H(3-0)(Area II)**
(formerly Psychology 487)

Health Psychology

Concepts linking psychology to issues of physical health and illness. Lectures and student-led presentations include mind-body issues, emotions and body awareness, stress-management, psychoimmunology, psychopharmacology, pain, health, and social support.

Prerequisite: Psychology 205.

Note: Restricted to Psychology Majors and Honours students with third or fourth year standing.

Psychology 441 **H(3-2)(Area II)**
(formerly Psychology 445)

Social Psychology: Theory and Research

A review of current theory and research in the area of social psychology. Research projects will introduce methodologies used in this area.

Prerequisites: Psychology 312 and 345.

Note: Sociology 341 does not substitute for Psychology 345 as a prerequisite.

Psychology 443 **H(3-0)(Area II)**

Interpersonal Relationships

Application of social psychological theory and methodology to a variety of topics in the area of interpersonal relationships such as attraction, close relationships, interpersonal conflict, communication, and power. Course projects will be an integral part of the course.

Prerequisites: Psychology 312 and 345.

Note: Sociology 341 does not substitute for Psychology 345 as a prerequisite.

Psychology 447 **H(3-0)(Area II)**

Advanced Topics in Personality or Social Psychology

An examination of current research topics in personality or social psychology or gender.

Prerequisites: Psychology 205 and appropriate 300-level course. Students are advised to consult with the Department regarding specific prerequisites for the course in a given year.

Note: May be repeated once for credit with consent of the Department.

Psychology 449 **H(3-2)(Area II)**
(formerly Psychology 453)

Experimental Child Psychology: Social-Personality Development

Socialization processes and behaviours from birth to adolescence; observational learning, altruism, moral development, sex-roles, dependency, emotional development, and social motivation.

Prerequisites: Psychology 312 and one of 351 or 355.

Psychology 451 **H(3-1)(Area III)**

Experimental Child Psychology: Basic Processes

Neonatal, infant, and child behaviour drawn from the laboratory and experimental research; sensory and basic learning processes and perceptual-cognitive development.

Prerequisites: Psychology 312 and 351.

Psychology 455 **H(3-0)(Area III)**

Sensory, Perceptual, and Cognitive Aspects of Aging

Basic research and contemporary issues in the age-related changes in sensation, perception, attention, learning and memory, intelligence and problem-solving.

Prerequisites: Psychology 312 and 353.

Note: Not open to students with credit in Psychology 553.

Psychology 457 **H(3-0)(Area II)**

Social and Clinical Aspects of Aging

Stability and change in the later years of life with a focus on social and clinical areas of aging.

Prerequisites: Psychology 312 and 353.

Note: Not open to students with credit in Psychology 553.

Psychology 459 **H(3-0)(Area II)**
(formerly Psychology 559)

Developmental Psychopathology

A critical examination of developmental psychopathology during childhood and adolescence with an emphasis on the characteristics of the disorders, their determinants, and outcomes. Current theories and research, and recent trends in intervention and prevention will be emphasized.

Prerequisite: Psychology 359.

Psychology 461 **H(3-2)(Area III)**

Learning: Theory and Research

Traditional and contemporary learning theory emphasizing infrahuman data.

Prerequisite: Psychology 312.

Psychology 463 **H(3-2)(Area III)**

Memory

Current and classic memory research is explored. Topics include how memories are encoded, stored, and retrieved. Laboratory projects introduce methodologies used in memory research.

Prerequisites: Psychology 312 and 365.

Psychology 465 **H(3-2)(Area III)**

Research in Cognitive Psychology

Current research in human memory, thinking, attention, and language processing is explored. Laboratory projects will introduce research methodologies used in these areas.

Prerequisites: Psychology 312 and 365.

Psychology 467 **H(3-2)(Area III)**

Experimental Psycholinguistics

Exploration of the cognitive, neuropsychological, and social processes that underlie language abilities. A laboratory component provides experience with methodologies used to study language behaviour.

Prerequisite: Psychology 312.

Psychology 469 **H(3-2)(Area III)**

Visual Perception

A systematic examination of vision and its role in our interactions with the natural environment. Topics may include: the physics of light; optics; eye and retina; visual pathways and visual brain; perception of color, space, change and motion; visual development and aging; art and vision; visual disorders; and recovery from blindness.

Prerequisites: Psychology 312 and 369.

Psychology 471 **H(3-2/2)(Area III)**

Auditory Processing

Basic acoustics, anatomy, and physiology of the auditory system, psychoaccoustics (sensitivity to various aspects of sound), speech perception, and effects of noise on hearing.

Prerequisites: Psychology 312 and 369.

Psychology 473 **H(3-0) (Area III)**

Advanced Evolutionary Psychology

Human behaviour as illuminated by comparative research in animals. An evolutionary approach dealing with the human mind as a set of information programs.

Prerequisites: Psychology 312 and 377.

Psychology 475 **H(3-0)(Area III)**

Behavioural Pharmacology

The behavioural effects of drugs specifically employed to affect the nervous system, as seen in the treatment of mental disorders, behavioural disorders, and other conditions such as Parkinson's, Huntington's and Alzheimer's diseases. Neuropharmacologic agents will be discussed as they relate to the biochemistry and physiology of putative neurotransmitters.

Prerequisite: Psychology 371 or 375.

Psychology 476 **F(3-3)(Area III)**

Physiological Psychology

Physiological bases of sensory, perceptual, motivational, emotional, learning, and motor processes. The functioning of the nervous system in these processes is emphasized.

Prerequisite: Psychology 371 or 375.

Psychology 479 **H(3-2)(Area III)**

Human Neuropsychology

Integration of the literature on human brain damage with the evidence from animal research. Topics include developmental neuropsychology; cognitive deficits associated with frontal, parietooccipital, and temporal lobes; origins and mechanisms in the determination of cerebral dominancy; disorders of learning and memory; long-term effects of cerebral lesions.

Prerequisite: One of Psychology 371 or 375.

Psychology 489 **H(3-3T)(Area II)**

The Psychology of Creativity

Personality characteristics of creative people, and the psychological experiences they report while working. Theoretical accounts of creativity provided by psychologists will be particularly emphasized. Tutorials will include feature films that dramatize lecture topics.

Prerequisite: Psychology 205.

Note: Psychology 209 is recommended as a preparation for this course.

Psychology 491 **H(3-0)(Area III)**

Cross-Cultural Cognition

Theory and research on the interaction of culture and human cognition. Topics include cross-cultural research in perception, language processing, memory, concepts, and reasoning.

Prerequisite: Psychology 365.

Psychology 497 **H(3-0)(Area III)**

Consciousness

An exploration of the origin, nature, and function of consciousness as informed by research on conscious and unconscious processes, psychological disorders, neuropsychological case studies, consciousness-altering drugs, hypnosis, meditation, state-dependent memory, sleep, and dreams.

Prerequisites: Psychology 312 and 365.

Psychology 501 **H(3S-0)(Area II)**

Special Topics Seminar

Selected topics from one or more of the following areas in psychology: aging, clinical, developmental, industrial, organizational, personality, social, history, and theory.

Prerequisites: Psychology 312 and consent of the Department.

Note: May be repeated once for credit with the consent of the Department. Students should consult the Department concerning topics and recommended preparation for a given session.

Psychology 503 **H(3-0)(Area II)**

Conference Course in Psychology

Selected topics from one or more of the following areas in psychology: aging, clinical, developmental, industrial, organizational, personality, social, history, and theory.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 504 **F(3-3)(Area III)**

Conference Course in Psychology

Research project from one of the following areas in psychology: behavioural neuroscience, cognition, human factors, learning motivation, sensation, perception, and quantitative methods.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 505 **H(3-3)(Area III)**

Conference Course in Psychology

Research project from one of the following areas in psychology: behavioural neuroscience, cognition, human factors, learning motivation, sensation, perception, and quantitative methods.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 506 **F(3-3)(Area II)**

Research in Psychology

Research project from one of the following areas in psychology: aging, clinical, developmental, industrial, organizational, personality, social, history, and theory.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 507 **H(3-0)(Area III)**

Conference Course in Psychology

Selected topics from one or more of the following areas in psychology: behavioural neuroscience, cognition, cognition, human factors, learning, motivation, sensation, perception and quantitative methods.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 509 **H(3-3)(Area II)**

Research in Psychology

Research project from one of the following areas in psychology: aging, clinical, developmental, industrial, organizational, personality, social, history, and theory.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 511 **H(3S-0)(Area III)**

Special Topics Seminar

Selected topics from one or more of the following areas in psychology: behavioural neuroscience, cognition, human factors, learning, motivation, sensation, perception and quantitative methods.

Prerequisites: Psychology 312 and consent of the Department.

Note: May be repeated once for credit with the consent of the Department. Students should consult the Department concerning topics and recommended preparation for a given session.

Psychology 591 **H(3-0)(Area III)**

Advanced Topics in Cognitive Psychology

A detailed examination of current research topics in cognitive psychology. Topics may include one or more of the following: human memory, thinking, attention, language processing, and computer modelling.

Prerequisite or Corequisite: Psychology 465.

MAY BE REPEATED FOR CREDIT

Psychology 596 **F(2S-6)(Area II)**

BA Honours Thesis and Seminar

Research project under the direction of a member of the Department. In the seminar, students will present and discuss their projects and other topics of current relevance.

Prerequisite: Admission to Honours BA program.

Psychology 598 **F(2S-6)(Area III)**

BSc Honours Thesis and Seminar

Research project under the direction of a member of the Department. In the seminar, students will present and discuss their projects and other topics of current relevance.

Prerequisite: Admission to Honours BSc program.

Graduate Courses

Psychology 601 **H(3-0)**

History and Systems of Psychology

History of psychological concepts in Western culture, major theoretical systems of twentieth century psychology, foundational assumptions of theories in contemporary psychology.

Prerequisite: Consent of the Department.

Psychology 602 **F(0-3)**

Research in History/Systems/Theoretical Psychology

Research project emphasizing recent developments in theory, methodology and foundational issues and/or the development of historiography in the discipline.

Prerequisite: Consent of the Department.

Psychology 603 **H(3-0)**

Graduate Conference Course in Psychology

Offered under various subtitles. Consult Department for details.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 604 **F(3-0)**

Graduate Conference Course in Psychology

Offered under various subtitles. Consult Department for details.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 605 **H(3-0)**

Advanced Topics in Theoretical Psychology

An advanced survey of some of the fundamental issues and recent developments in theoretical psychology.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 611 **H(3-3)**

Advanced Research Analysis in Qualitative and Historical Psychology

Qualitative Research Designs and Historical Research in Psychology. Topics include Discourse Analysis, Grounded Theory and related techniques, problems of theory development in research and archival research methods in the history of psychology.

Prerequisite: Consent of the Department.

Psychology 613 **H(3-3)**

Signal and Systems Analysis in Behavioural Research

Application of signal and systems analysis to behavioural neuroscience and psychophysics.

Prerequisite: Consent of the Department.

Psychology 615 **H(3-3)**

Advanced Research Design and Analysis I

Applications of the general linear model to research design and analysis. Topics include analysis of variance, regression, and analysis of covariance.

Prerequisite: Consent of the Department.

Psychology 617 **H(3-3)**

Advanced Research Design and Analysis II

Multivariate techniques and design issues, including canonical correlation, discriminant analysis, multivariate analysis of variance, multivariate regression, principal components analysis and factor analysis.

Prerequisite: Psychology 615 or consent of the Department.

Psychology 619 **H(3-3)**

Special Topics in the Design of Psychological Research

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 621 **H(3-0)**

Advanced Topics in Sensation and Perception

An in-depth survey of classic findings and contemporary issues in visual and auditory processing, including attentional mechanisms and imaging research.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 622 **F(0-3)**

Research in Sensation and Perception

Original project on a contemporary research problem in vision and/or audition. Specific project will vary with student and supervisor interest as well as available research facilities. Possible research areas include aspects of sight or hearing, speech perception, visual attention, and age-related changes in these functions.

Prerequisite: Consent of the Department.

Psychology 623 **H(3-0)**

Advanced Topics in Cognition

An advanced survey of some of the fundamental issues and recent developments in the cognitive sciences.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 624 **F(0-3)**

Research in Cognition

Empirical research in cognitive psychology conducted under the supervision of a faculty member.

Prerequisite: Consent of the Department.

Psychology 625 **H(3-0)**

Advanced Topics in Developmental Psychology and Aging

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 626 **F(0-3)**

Research in Development/Aging

Original faculty-supervised research project on a contemporary research problem in infancy, childhood, adolescence or adult aging. While specific project will vary with student and supervisor interest as well as available facilities, possible research areas include age-related differences or change in auditory, cognitive, language, moral, social, clinical or visual functioning.

Prerequisite: Consent of the Department.

Psychology 627 **H(3-0)**

Advanced Topics in Social/Personality Psychology

Prerequisites: An underGraduate Course in social psychology and consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 628 **F(0-3)**

Research in Social/Personality

Completion of an original research project in the areas of social and/or personality psychology.

Prerequisite: Consent of the Department.

Psychology 629 **H(3-0)**

Advanced Topics in Cognitive Development

An advanced survey of fundamental issues and recent developments in cognitive development.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 630 **F(0-3)**

Research in Cognitive Development

Empirical research in cognitive developmental psychology conducted under the supervision of a faculty member.

Prerequisite: Consent of the Department.

Psychology 631 **H(3-0)**

Advanced Topics in Behavioural Neuroscience

Prerequisites: Psychology 476 or equivalent and consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 632 **F(0-3)**

Research in Behavioural Neuroscience

Behavioural neuroscience theory and techniques including behavioural analysis, electrophysiological recording and anatomical methods.

Prerequisite: Consent of the Department.

Psychology 637 **H(3-3)**

Topics in Engineering Psychology

Introduction to psychological principles, research and methods as they relate to human interaction and performance in work settings.

Prerequisite: Consent of the Department.

Psychology 638 **F(0-3)**

Research in Engineering Psychology

Original project on a research problem in the human factors, including human-computer interaction, driving behaviour, usability, and performance in work settings.

Prerequisite: Consent of the Department.

Psychology 639 **H(3-0)**

Advanced Industrial and Organizational Psychology

Application of psychological principles, research and methods relating to human interactions and performance in work settings.

Prerequisite: Consent of the Department.

Psychology 650 **F(1S-0)**

Research Seminar in Clinical Psychology

An introduction to research and design issues in clinical psychology.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 651 **H(3-0)**

Adult Psychopathology

Current theory, issues, and research regarding the epidemiology, etiology, diagnosis, and prognosis of adult psychopathology. Implications for assessment and treatment.

Psychology 653 **H(3-0)**

Child Psychopathology

Current theory, issues, and research regarding the epidemiology, etiology, diagnosis, and prognosis of child psychopathology. Implications for assessment and treatment. Topics include internalizing and externalizing disorders, risk and protective factors, and developmental continuities and discontinuities in psychopathology.

Psychology 659 **H(3-0)**

Ethics and Professional Issues in Clinical Psychology

Ethical and legal standards for clinical psychologists. An introduction to professional issues in contemporary clinical practice.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 660 **F(0-14)**

Summer Practicum in Clinical Psychology I

Supervised training experience in an approved clinical setting. Provides exposure to basic issues and techniques in the practice of psychological assessment.

Note: Open only to students enrolled in the Clinical Psychology program.

NOT INCLUDED IN GPA

Psychology 662 **F(0-14)**

Summer Practicum in Clinical Psychology II

Supervised clinical training in an approved clinical setting. Provides exposure to the basic issues and techniques in the practice of psychological assessment and psychotherapy.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 671 **H(3-3)**

Psychological Assessment of Adults

An overview of theoretical, professional, and ethical issues in the psychological assessment of adult clinical populations. Instruction in the administration and interpretation of assessment procedures for adults including interviews, behavioural assessments, and selected intellectual and personality tests. Supervised practical experience in the application of adult assessments in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 673 **H(3-3)**

Psychological Assessment of Children

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.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 681 **H(3-3)**

Adult Psychotherapy

Theory, research, and practice in adult psychotherapy and behaviour change. Supervised exposure to the practice of adult psychotherapy in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 683 **H(3-3)**

Child Psychotherapy

Theory, research, and practice in child and family psychotherapy and behaviour change. Supervised exposure to the practice of child and family psychotherapy in a relevant clinical setting.

Note: Open only to students enrolled in the Clinical Psychology program.

Psychology 699 **H(0-3)**

Research Course in Psychology

Offered under various subtitles. Consult the Department for details.

Prerequisite: Consent of the Department

Note: May be repeated for credit with the consent of the Department.

Psychology 701 **H(3S-0)**

Graduate Teaching Seminar

This seminar aims to foster the development of graduate student instruction/presentation skills. Topics covered include the development of new courses, lecturing, leading discussion, motivating students, computer-assisted instruction, development of A-V materials, the use of instructional technology, examination and grade management, marking, and ethical/protocol/misconduct issues in the classroom. Students will also be provided with teaching experience and feedback in a supportive environment.

Psychology 705 **H(3-0)**

Seminar in History/Systems/Theoretical Psychology

Selected topics in the history of twentieth-century psychology and the theoretical problems of modern psychology.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 706 **F(0-3)**

Research in History/Systems/Theoretical Psychology

Advanced research in recent developments in theory, methodology and foundational issues and/or the development of historiography in the discipline.

Prerequisite: Consent of the Department.

Psychology 721 **H(3-0)**

Seminar in Sensation and Perception

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 722 **F(0-3)**

Research in Sensation and Perception

Advanced project on a contemporary research issue in vision and/or audition. Specific project will vary with student and supervisor interest as well as available research facilities, possible research areas include spatiotemporal aspects of sight or hearing, speech perception, visual attention, and age-related changes in these functions.

Prerequisite: Consent of the Department.

Psychology 723 **H(3-0)**

Seminar in Cognition

Selected topics in cognitive psychological theory and research.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 724 **F(0-3)**

Research in Cognition

Empirical research in cognitive psychology conducted under the supervision of a faculty member.

Prerequisite: Consent of the Department.

Psychology 725 **H(3-0)**

Seminar in Developmental Psychology

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 726 **F(0-3)**

Research in Developmental Psychology

Advanced faculty-supervised research project on contemporary research problems in infancy, childhood, adolescence. Specific project will vary with student and supervisor interest as well as available facilities. Possible research areas include the study of normal or abnormal developmental aspects of early-life differences or change in auditory, cognitive, emotional, language, moral, perceptual or sensory functioning.

Prerequisite: Consent of the Department.

Psychology 727 **H(3-0)**

Seminar in Social/Personality Psychology

Selected topics related to interpersonal processes, gender, justice, and personality and its assessment.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 728 **F(0-3)**

Research in Social/Personality Psychology

Advanced research project in the areas of social and/or personality psychology.

Prerequisite: Consent of the Department.

Psychology 729 **H(3-0)**

Seminar in Current Gerontological Issues

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 730 **F(0-3)**

Research in Current Gerontological Issues

Advanced faculty-supervised research project on contemporary research problem in adult aging. Specific research topic depends on student and supervisor interest as well as available facilities. Possible areas of study include age-related differences or change in auditory, cognitive, emotional, linguistic, social or visual functioning.

Prerequisite: Consent of the Department.

Psychology 731 **H(3-0)**

Seminar in Behavioural Neuroscience

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 732 **F(0-3)**

Research in Behavioural Neuroscience

Behavioural neuroscience theory and techniques including: behavioural analysis, electrophysiological recording and anatomical methods.

Prerequisite: Consent of the Department.

Psychology 733 **H(3-0)**

Seminar in Cognitive Development

Selected topics in cognitive development.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 734 **F(0-3)**

Research in Cognitive Development

Empirical research in cognitive development conducted under the supervision of a faculty member.

Prerequisite: Consent of the Department.

Psychology 737 **H(3S-0)**

Seminar in Ergonomics

Application of psychological principles and methods to the design of complex systems and to the operator/system interface.

Prerequisites: Psychology 637/639 or consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 739 **H(3S-0)**

Seminar in Industrial/Organizational Psychology

Application of psychological principles and methods to business, industry and other organizational settings.

Prerequisites: Psychology 639 or consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 750 **F(2-0)**

Advanced Seminar in Clinical Psychology

A doctoral level seminar in advanced topics in the practice of clinical psychology including psychopharmacology, health psychology, group therapy, family therapy, pediatric psychology, neuropsychology, forensic psychology, diversity issues in clinical psychology, couple and sex therapy, clinical gerontology, and others.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

Psychology 751 **H(3-0)**

Special Topics in Adult Psychopathology

A specialized topic course in the area of adult psychopathology. Course offerings will vary from year to year and may include such topics as: schizophrenia, substance abuse, suicide, mental health delivery systems, or computer applications in clinical psychology.

MAY BE REPEATED FOR CREDIT

Psychology 753 **H(3-0)**

Special Topics in Child and Family Psychopathology

A specialized topic course in the area of child and family psychopathology. Course offerings will vary from year to year and may include such topics such as: developmental psychopathology, family violence, early prevention and intervention, or multicultural issues.

MAY BE REPEATED FOR CREDIT

Psychology 760 **F(1-7)**

Specialty Practicum in Clinical Psychology I

Supervised training experience in an approved clinical setting. Provides in-depth exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

NOT INCLUDED IN GPA

Psychology 762 **F(1-7)**

Specialty Practicum in Clinical Psychology II

Supervised training experience in an approved clinical setting. Provides advanced in-depth exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 765 **H(1-7)**

Practicum in Clinical Psychology

Supervised training experience in an approved clinical setting. Provides exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Psychology 782 **F(0-3)**

Senior Psychology Practicum

Prerequisite: Consent of the Department.

Psychology 798

Pre-Doctoral Internship in Clinical Psychology

A full calendar year, full-time (or two-years, half-time) supervised training experience in an approved clinical setting. Intensive exposure to various professional issues, the opportunity to work with a diverse range of clinical populations and problems, and advanced training in the use of specific psychological assessment and intervention strategies.

Note: Open only to students enrolled in the Clinical Psychology program.

NOT INCLUDED IN GPA

Psychology 799 **H(0-3)**

Research Course in Psychology

Offered under various subtitles. Consult the Department for details.

Prerequisite: Consent of the Department.

Note: May be repeated for credit with the consent of the Department.

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.

Pure Mathematics PMAT

Instruction offered by members of the Department of Mathematics and Statistics in the Faculty of Science.

Department Head – T. Bisztriczky

Note: For listings of related courses, see Actuarial Science, Applied Mathematics, Mathematics, and Statistics.

Note: The following courses, although offered on a regular basis, are not offered every year: Pure Mathematics 371, 415, 419, 423, 425, 427, 501, 505, 511, 517, 521, and 545. Check with the divisional office to plan for the upcoming cycle of offered courses.

Senior Courses

Pure Mathematics 315 **H(3-1T)**

Abstract Algebra

Integers: division algorithm, prime factorization. Groups: permutations, Lagrange's theorem. Rings: congruences, polynomials.

Prerequisite: Mathematics 211 or 221.

Pure Mathematics 319 **H(3-1T)**

Transformation Geometry

Geometric transformations in the Euclidean plane. Frieze patterns. Wallpaper patterns. Tessellations.

Prerequisites: Mathematics 211 or 221 and one other 200-level Mathematics course.

Pure Mathematics 329 **H(3-1T)**

Introduction to Cryptography

Description and analysis of cryptographic methods used in the authentication and protection of data. Classical cryptosystems and cryptanalysis, information theory and perfect security, the Data Encryption Standard (DES) and Public-key cryptosystems.

Prerequisite: Mathematics 271.

Note: Credit for both Pure Mathematics 329 and 321 will not be allowed.

Pure Mathematics 371 **H(3-1T)**

Combinatorial Mathematics

Counting, graph theory, combinatorial optimization.

Prerequisite: Mathematics 271.

Pure Mathematics 415 **H(3-1T)**

Set Theory

Axioms for set theory, the axiom of choice. Zorn's lemma and equivalents. Applications. Cardinal and ordinal arithmetics.

Prerequisite: Mathematics 271 or 311 or 353 or Pure Mathematics 315 or consent of the Division.

Pure Mathematics 419 (Statistics 419) **H(3-0)**

Information Theory and Error Control Codes

Information sources, entropy, channel capacity, development of Shannon's theorems, development of a variety of codes including error correcting and detecting codes.

Prerequisites: Mathematics 311, and Mathematics 321 or any Statistics course, or consent of the Division.

Pure Mathematics 421 **H(3-1T)**

Introduction to Complex Analysis

Complex numbers. Analytic functions. Complex integration and Cauchy's theorem. Maximum modulus theorem. Power series. Residue theorem.

Prerequisites: Mathematics 349 and 353; or consent of the Division.

Note: Credit for both Pure Mathematics 421 and 521 will not be allowed.

Pure Mathematics 423 **H(3-0)**

Differential Geometry

Fundamentals of the Gaussian theory of surfaces. Introduction to Riemannian geometry. Some topological aspects of surfaces.

Prerequisite: Mathematics 353 or consent of the Division.

Pure Mathematics 425 **H(3-1T)**

Geometry

Affine and projective planes, collineations, linear transitivity, projective closure, Ternary rings and the theorems of Desargues and Pappus.

Prerequisite: Pure Mathematics 315 or consent of the Division.

Pure Mathematics 427 **H(3-1T)**

Number Theory

Induction principles. Division Algorithm. Prime factorization theorem. Congruences. Arithmetic functions. Diophantine equations. Continued fractions.

Prerequisite: Pure Mathematics 315 or consent of the Division.

Pure Mathematics 429 **H(3-0)**

Cryptography - The Design of Ciphers

Review of basic algorithms and complexity. Symmetric key cryptography. Discrete log based cryptography. One-way functions and Hash functions. Knapsack. Introduction to primality testing. Factoring. Other topics may include elliptic curves, zero-knowledge, and quantum cryptography.

Prerequisite: Pure Mathematics 321 or 329.

Prerequisite or Corequisite: Pure Mathematics 427.

Pure Mathematics 431 **H(3-1T)**

Groups, Rings and Fields

Factor groups and rings, polynomial rings, field extensions, finite fields, Sylow theorems, solvable groups. Additional topics.

Prerequisites: Mathematics 311 and Pure Mathematics 315 or consent of the Division.

Pure Mathematics 435 **H(3-1T)**

Analysis I

Numbers, functions; sequences; limits and continuity; theory of differentiation and integration of functions of a single variable.

Prerequisite: Mathematics 253 or 263 or consent of the Division.

Note: This course is offered in the Fall Session and would normally be taken in the third year. Potential honours students are urged to consider taking this course in second year. Please consult the appropriate Division Chair.

Pure Mathematics 445 **H(3-1T)**

Analysis II

Series; sequences and series of functions, uniform convergence; basic topology in Euclidean spaces; analysis with functions of several variables; implicit and inverse function theorems.

Prerequisites: Mathematics 353 and Pure Mathematics 435, or consent of the Division.

Corequisite: Mathematics 311.

Pure Mathematics 471 **H(3-0)**

Discrete Optimization

Block designs and extremal set theory, efficiency of algorithms, complexity theory, trees and sorting, graphs and transversals of families of sets, networks and the max-flow min-cut theorem, dynamic programming, recursion.

Prerequisite: Pure Mathematics 371.

Pure Mathematics 501 **H(3-0)**

Integration Theory

Abstract measure theory, basic integration theorems, Fubini's theorem, Radon-Nikodym theorem, further topics.

Prerequisite: Pure Mathematics 545 or consent of the Division.

Note: Credit for both Pure Mathematics 501 and 601 will not be allowed.

Pure Mathematics 503 **H(3-0)**

Topics in Pure Mathematics

This course is offered under various subtitles. Consult Department for details.

Prerequisite: Consent of the Division.

MAY BE REPEATED FOR CREDIT

Pure Mathematics 505 **H(3-0)**

Topology I

Metric spaces. Introduction to general topology.

Prerequisite: Pure Mathematics 435 or consent of the Division.

Pure Mathematics 511 **H(3-0)**

Rings and Modules

Ring theory, and structure of modules. Application to Abelian groups and linear algebra. Additional topics.

Prerequisite: One of Pure Mathematics 431, Applied Mathematics 441; or consent of the Division.

Pure Mathematics 519 **H(3-0)**

Information Theory, Codes, and Cryptography

A continuation of Pure Mathematics 419. Topics include: Entropy, Shannon's Theorem, Hamming codes, Reed-Muller codes, Reed-Solomon codes, M.D.S. codes and finite geometries, Ergodic and Markov processes.

Prerequisites: Mathematics 311, Pure Mathematics 371 and 419.

Pure Mathematics 521 **H(3-0)**

Complex Analysis

A rigorous study of functions of a single complex variable. Consequences of differentiability. Proof of the Cauchy integral theorem, applications.

Prerequisite: Pure Mathematics 435 or consent of the Division.

Note: Credit for both Pure Mathematics 521 and 421 will not be allowed.

Pure Mathematics 529 **H(3-0)**

Advanced Cryptography and Cryptanalysis

Probability and perfect secrecy. Provably secure cryptosystems. Prime generation and primality testing. Cryptanalysis of factoring-based cryptosystems. Discrete log based and elliptic curve cryptography and cryptanalysis. Other advanced topics may include hyperelliptic curve cryptography, other factoring methods and other primality tests.

Prerequisites: Pure Mathematics 427 and 429.

Pure Mathematics 545 **H(3-1T)**

Analysis III

Metric spaces and function spaces; equi-continuity; trigonometric series and Fourier series; elements of Lebesgue integration.

Prerequisite: Pure Mathematics 445 or consent of the Division.

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: Pure Mathematics 545 or consent of the Division.

Note: 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

General topology, elementary combinatorial topology.

Prerequisite: Pure Mathematics 505 or consent of the Division.

Pure Mathematics 613 **H(3-0)**

Introduction to Field Theory

Field theory, Galois theory.

Prerequisite: Pure Mathematics 511 or consent of the Division.

Pure Mathematics 615 **H(3-0)**

Topics in Logic

MAY BE REPEATED FOR CREDIT

Pure Mathematics 617 **H(3-0)**

Analysis IV

Analysis in abstract spaces. Function spaces.

Prerequisite: Pure Mathematics 545.

Pure Mathematics 621 **H(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 year.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Pure Mathematics 631 **H(3-0)**

Algebraic Topology I

Elements of category theory and homological algebra. Various examples of homology and cohomology theories. Eilenberg-Steenrod axioms. Geometrical applications.

Pure Mathematics 633 **H(3-0)**

Algebraic Topology II

Cohomology operations, CW-complexes, introduction to homotopy theory.

Pure Mathematics 642 **F(3-0)**

Differentiable Manifolds

Definition of differentiable manifold. Vector fields and differentiable forms. Connections. Curvature. Relations between topology and geometry.

Pure Mathematics 685 **H(3-0)**

Topics in Algebra

The following topics are available as decimalized courses: Algebraic Number Theory, Algebraic K-Theory, Representation Theory, Abelian Group Theory, Brauer Group Theory, Homological Algebra, Ring Theory, Associative Algebras, Commutative Algebra, Universal Algebra.

MAY BE REPEATED FOR CREDIT

Pure Mathematics 707 **H(3-0)**

Topics in Topology

The following topics are available as decimalized courses: Fibre Bundles, Characteristic Classes, K-Theory of Vector Bundles, Theory of Transformation Groups, Homotopy Theory.

MAY BE REPEATED FOR CREDIT

Pure Mathematics 717 **H(3-0)**

Topics in Analysis

The following topics are available as decimalized courses: Abstract Harmonic Analysis, Gelfand Theory for Banach Algebras and C*-Algebras, Invariant Means on Semigroups, Functional Analysis, Differential Operator Theory, Spectral Theory of Operators, Integral Transforms, Matrix

Theory, Analysis of Manifolds, Dynamical Systems, Differential Equations.

MAY BE REPEATED FOR CREDIT

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.