2011-2012 Graduate Calendar

The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2011-2012 academic years, including the Fall Semester 2011, the Winter Semester 2012 and the Summer Semester 2012.

For your convenience the Graduate Calendar is available in PDF format.

If you wish to link to the Graduate Calendar please refer to the Linking Guidelines.

The University is a full member of:

- The Association of Universities and Colleges of Canada

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Disclaimer

The Office of Graduate Studies has attempted to ensure the accuracy of this on-line Graduate Calendar. However, the publication of information in this document does not bind the university to the provision of courses, programs, schedules of studies, fees, or facilities as listed herein.

Limitations

The University of Guelph reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs.

The university will not be liable for any interruption in, or cancellation of, any academic activities as set forth in this calendar and related information where such interruption is caused by fire, strike, lock-out, inability to procure materials or trades, restrictive laws or governmental regulations, actions taken by the faculty, staff or students of the university or by others, civil unrest or disobedience, Public Health Emergencies, or any other cause of any kind beyond the reasonable control of the university.

The University of Guelph reaffirms section 1 of the Ontario Human Rights Code, 1981, which prohibits discrimination on the grounds of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, handicap, age, marital status or family status.

The university encourages applications from women, aboriginal peoples, visible minorities, persons with disabilities, and members of other under-represented groups.

Introduction

Collection, Use and Disclosure of Personal Information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see http://www.uoguelph.ca/registrar/registrar/index.cfm?index.

Statistics Canada - Notification of Disclosure

For further information, please see Statistics Canada's web site at http://www.statcan.gc.ca and Section XIV Statistics Canada.

Address for University Communication

Depending on the nature and timing of the communication, the University may use one of these addresses to communicate with students. Students are, therefore, responsible for checking all of the following on a regular basis:

Email Address

The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly.

Home Address

Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through the Office of Graduate Studies.

Name Changes

The University of Guelph is committed to the integrity of its student records, therefore, each student is required to provide either on application for admission or on personal data forms required for registration, his/her complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of his or her record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work.

Complete policy at http://www.uoguelph.ca/policies.

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Appendix A - Courses

Courses are listed in the appendix in alphabetic order and may also be found listed under the program in which they are offered.

Agricultural Business

AGBU*6070 Research Methods for Managers W [0.50]

The objective of the course is to provide students with a working knowledge of quantitative and qualitative techniques used in the analysis of management problems. The emphasis is on the application and interpretation of quantitative and qualitative methods rather than on theoretical background.

Restriction(s): CME Executive Programs students only

AGBU*6100 Food and Agribusiness Economics and Policy U [0.50]

An analysis of economic and policy issues relevant for food and agribusiness managers in affluent economies, with emphasis on the economic and policy environment that exists within North America.

Restriction(s): CME Executive Programs students only

AGBU*6120 Marketing Management W [0.50]

A study of marketing decision-making in food and agribusiness firms, with emphasis on the formulation of strategic marketing plans.

Restriction(s): CME Executive Programs students only

AGBU*6180 Financial and Managerial Accounting U [0.50]

This course emphasizes the gathering and use of financial information to facilitate effective financial and management decisions. Cases are used to approach the subject from the perspective of the user of accounting information rather than that of the supplier.

Restriction(s): CME Executive Programs students only

AGBU*6200 Financial Management U [0.50]

This course takes the viewpoint of the senior financial officer of a commercial enterprise. The focus is on the management of cash, accounts receivable, inventories and capital assets, as well as on the sourcing of funds through short-term liabilities, long-term debt and owners' equity.

Prerequisite(s): AGBU*6180
Restriction(s): CME Executive Programs students only

AGBU*6300 Problems in Agribusiness - Summer Residency S [0.50]

A seven-day intensive session, delivered at the University of Guelph, that focuses on the development of a management plan for an agribusiness organization through the use of group case studies, seminars and speakers.

Restriction(s): CME Executive Programs students only

AGBU*6400 Food and Agribusiness Strategic Management U [0.50]

An advanced course requiring the application of conceptual, analytical, problem identification, and problem solving skills to develop organizational strategy. Food, agribusiness and other cases are used to explore the development and implementation of strategy and to assess the dynamic relationship between strategy and competition.

Restriction(s): CME Executive Programs students only

AGBU*6510 Managing Price Risk W [0.50]

The course deals with the use of futures, options and other instruments for marketing, risk management and investment purposes. Emphasis is placed on the development and implementation of trading strategies and on the policy and corporate governance framework necessary to support effective management.

Restriction(s): CME Executive Programs students only

AGBU*6520 Marketing Research and Analysis F [0.50]

Students will learn the fundamentals of marketing research and analysis as they apply to decision-making. The key focus of the course will be on developing a marketing plan for a real product/service. Input into the marketing plan will come from actual marketing research information collected, analyzed and interpreted by participants. Students will develop and implement background-marketing research that can be used at the conclusion of the course to build the marketing plan. In addition to developing general research skills, special topics such as perceptual mapping for positioning, conjoint analysis for pricing and clustering for segmentation will be examined.

Restriction(s): CME Executive Programs students only

AGBU*6530 Management Issues in Agriculture W [0.50]

This course discusses the application of general management concepts and practices to agricultural production. Topics include strategies farm managers can use to assess performance, set direction, build capabilities and implement change. All readings and cases are taken from the viewpoint of an owner-operator of a commercial farming operation.

Restriction(s): CME Executive Programs students only

AGBU*6610 Dairy Production Management W [0.50]

This course deals with the specifics of applying business management strategies to farm operations. Trends facing the North American dairy industries and challenges faced by individual producers are examined. Relevant and practical operating decision-making and management skills are considered with the intent of maximizing the profitability and reducing the risk of the individual firm.

Restriction(s): CME Executive Programs students only

AGBU*6620 Swine Production Management W [0.25]

This course deals with the specifics of applying business management strategies to farm operations. Trends facing the North American swine industries and challenges faced by individual producers are examined. Relevant and practical operating decision-making and management skills are considered with the intent of maximizing the profitability and reducing the risk of the individual firm.

Restriction(s): CME Executive Programs students only

AGBU*6700 Special Topics in Agribusiness Management U [0.50]

A special topic course focusing on relevant business issues or problems allowing students to enhance and further develop expertise in specific areas of management. May be offered to students in any semester.

Restriction(s): CME Executive Programs students only

AGBU*6800 Directed Research Project U [0.50]

A management research project leading to a referenced report focusing on selected topics of interest in agricultural business.

Restriction(s): CME Executive Programs students only

Animal Science

ANSC*6010 Topics in Comparative Animal Nutrition F [0.50]

Current topics in the feeding and nutrition of agricultural, companion and captive animal species. Emphasis is placed on the influence of nutrients on metabolic integration at tissue, organ and whole-animal levels.

ANSC*6020 Poultry and Swine Nutrition W [0.50]

A discussion of current topics in the feeding and nutrition of domestic fowl and swine based on the critical appraisal of selected journal readings.

ANSC*6030 Modelling Metabolic Processes F [0.50]

Building and testing of mathematical models of metabolic processes using continuous simulation software to assist in weekly assignments. Choice of model based on students' research interests (e.g. protein synthesis, nutrient uptake, rumen fermentation). Term project to reproduce model from scientific knowledge.

ANSC*6050 Biometry for Animal Sciences F [0.50]

For students involved in animal research. The course will provide outlines of appropriate presentation and analysis of experimental data with emphasis on different analytical techniques.

ANSC*6100 Special Project F,W,S [0.50]

Supervised program of study in some aspect of animal and poultry science that can involve an experimental project and/or detailed analysis of the literature.

ANSC*6210 Principles of Selection in Animal Breeding W [0.50]

Definition of selection goals, prediction of genetic progress and breeding values, and the comparison of selection programs.

ANSC*6240 Topics in Animal Genetics and Genomics F [0.50]

Current literature and classical papers pertaining to quantitative genetics, animal breeding and animal genomics are reviewed in detail through presentation, discussion and critical analysis.

ANSC*6250 Growth and Metabolism W [0.50]

Animal growth and metabolism are considered at the cellular level in a manner that extends beyond the basic disciplines of biometrics and biochemistry with attention focused on the main carcass components — muscle, fat and bone.

ANSC*6360 Techniques in Animal Nutrition Research F [0.50]

Theory and/or practices of techniques to evaluate feedstuffs and determine nutrient utilization in poultry, swine and ruminants is covered through lectures, short laboratories and a major project.

ANSC*6370 Quantitative Genetics and Animal Models F [0.50]

The course covers quantitative genetics theory associated with animal models; linear models applied to genetic evaluation of animals; estimation of genetic parameters for animal models; and computing algorithms for large datasets.

ANSC*6390 QTL and Markers W [0.50]

Advanced training in QTL mapping and selection assisted by genetic markers.

ANSC*6400 Mammalian Reproduction W [0.50]

Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids. (Odd years only.)

ANSC*6440 Advanced Critical Analysis in Applied Ethology F [0.50]

Students explore the process of scientific inquiry and experimental design within the context of applied ethology research. Discussions include the peer review process, critical analyses and applications of methods for applied animal behaviour research.

ANSC*6450 Topics in Animal Biotechnology W [0.50]

The impact of recombinant DNA techniques on present and future research in animal science and on the livestock industry is critically appraised.

ANSC*6460 Lactation Biology F [0.50]

An in-depth systems analysis of lactation,comparing the cow, pig, rat, human and seal. Mammary development from conception through to lactogenesis, lactation and involution will be covered. Hypotheses of regulation of the biochemical pathways of milk synthesis will be tested in relation to experimental observations.

ANSC*6470 Advanced Animal Nutrition and Metabolism I F [0.50]

A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals.

ANSC*6480 Advanced Animal Nutrition and Metabolism II W [0.50]

A systematic review of key aspects of lipid, vitamin and mineral utilization and metabolism in farm animals.

ANSC*6600 Seminar F,W [0.00]

This course is required for successful completion of MSc and PhD programs. The major findings of the thesis or major paper are presented to the department.

ANSC*6700 Animals in Society: Historical and Global Perspectives on Animal Welfare F [0.50]

A seminar course covering society's duties to animals. Students will learn about the major ethical theories that deal with society's duties towards animals, the main scientific approaches to animal welfare, and the relationship of science to ethics. A brief history of human-animal relationships will be covered and cultural differences described. Students will use this to analyze some current issues.

ANSC*6710 Assessing Animal Welfare in Practice W,S [0.50]

A lecture/seminar course covering the principles of applied animal welfare assessment. Students will learn what influences an animal welfare assessment and will understand the components necessary to create an effective and targeted animal welfare program for industry or regulatory application.

Prerequisite(s): ANSC*6700
External Course Code(s): Winter offering on-campus, Summer offering Distance Education.

ANSC*6720 Scientific Assessment of Affective States in Animals W [0.50]

Graduate students will explore the biology and validity of behavioural and physiological techniques used in animal welfare assessment of such phenomenon as: sympathetic activation, HPA functioning, stereotypic behaviour and preference responses. A combination of lecture, instructor-led discussion and student-led discussion will explore these areas of animal welfare assessment.

ANSC*6730 Applied Environmental Physiology: Applications to Animal Care Standards W [0.50]

A lecture/seminar course covering the principles of applied environmental physiology including temperature regulation, space requirements, animal responses to light and other aspects of the physical environment. Students pursue a topic in depth to develop or update recommended codes of practice and resource-based standards.

ANSC*6740 Special Topics in Applied Animal Welfare Science S [0.50]

A lecture/seminar course covering in depth topics in applied animal welfare science. The course will review the scientific research into the welfare of a specific animal species or a specific animal welfare problem common across species, focusing on the main threats to welfare, relevant indicators of welfare, and possible solutions to improve welfare.

ANSC*6900 Major Paper in Animal and Poultry Science F,W,S [1.00]

A detailed, critical review of an area of study related to the specialization of students in the MSc by course work and major paper option that includes analysis and interpretation of relevant data.

Anthropology

ANTH*6000 Public Issues Anthropology F [0.50]

This course will examine the interface between anthropological and public understandings of public issues, with sensitivity to the presence or absence of anthropological insights. The course will assure that students become well versed in how to synthesize the resources of various branches of the discipline.

Restriction(s): Restricted to incoming students in the program.

ANTH*6080 Anthropological Theory F [0.50]

An examination of classical and contemporary anthropological theory, including an emphasis on the most recent directions in the discipline.

ANTH*6140 Qualitative Research Methods W [0.50]

An examination of the methods of qualitative research, including participant observation and unstructured interviews, as well as the ethical considerations of fieldwork. Other topics, such as comparative and historical methods, may be included.

ANTH*6270 Diversity and Social Equality U [0.50]

This course will examine a range of approaches used in the study of intergroup relations, with special emphasis on struggles over influence and power. Students will acquire a deeper understanding of the complex intersection, as well as the overlap among forms of identity and group mobilization based on ethnic, linguistic, regional, class, gender, racial and other forms of social division. The course may also cover native issues and policies related to multiculturalism, equity and local or regional autonomy.

ANTH*6420 Global Agro-Food Systems, Communities and Rural Change U [0.50]

This course will reflect recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes, and social movements in the rural context. The course will encourage students to take a comparative and historical approach, focussing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.

ANTH*6460 Gender and Development F [0.50]

Cross-cultural and historical changes in gender relations and the roles/positions of women brought about by industrialization and the development of the world system. Critical examination of the predominant theories of gender relations, in so far as these inform development research and action in societies with different socio-economic systems. Introduction to the latest theories and research in the area of women and development, as well as with social and political actions undertaken by women themselves. This is one of the two alternative core courses for the Collaborative International Development Studies program.

ANTH*6480 Work, Gender and Change in a Global Context U [0.50]

This course will consider some of the theoretical frameworks available for examining work, workers and work places in the context of globalization, economic restructuring, and shifts in public policy. Using case studies of particular work worlds, the course may include topics such as changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work, and the regulation of work. The course will focus on the dialectical relationship between the configurations of gender, class, race and ethnicity and the transformation of work.

ANTH*6550 Selected Topics in Theory and Research U [0.50]

This course will be offered with varying content focusing on theory or research.

ANTH*6600 Reading Course U [0.50]

A program of directed reading, complemented with the writing of papers or participation in research. Reading courses are arranged by students through their advisors or advisory committees and must be approved by the chair of the department. This course may be repeated provided different content is involved.

ANTH*6660 Major Paper U [1.00]

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters.

Art and Visual Culture

AVC*6100 Proseminar: Critical Methods I F [0.50]

This proseminar explores the histories, theories, and methodologies of the fields of art history, visual culture, and material culture.

AVC*6200 Proseminar: Critical Methods II W [0.50]

This seminar is a multi-disciplinary survey of critical theory. The aim is to consider which bodies of theory have been—and continue to be—lively options for the practice of critical thought in relation to visual culture, especially post-1968. The course explores issues which also possess cultural, social and political relevance, theories which affected all the humanities and social sciences, and themes that are also deeply relevant outside the academy. These include: the institutions and networks of knowledge, identity politics, race, sexuality, gender and class, amongst others.

Prerequisite(s): AVC*6100

AVC*6300 Special Topics in Art and Visual Culture F [0.50]

This seminar explores issues of historical and crtical method by focusing them through the lens of a particular area of concern within the fields of art history, visual culture, and/or material culture.

AVC*6400 Practicum: Art Institutions W [0.50]

The practicum provides students with an opportunity to gain practical experience through work with an artist, curator, or other museum or arts professional.

AVC*6500 Directed Reading U [0.50]

Each student establishes, in consultation with the faculty member chosen, the content of this special study within the instructor's area of expertise. Faculty varies.

Bioinformatics

BINF*6110 Genomic Methods for Bioinformatics F [0.50]

This course provides an introduction to current and emerging methods used to generate genomic data analyzed in bioinformatics. This may include techniques for DNA sequencing as well as transcriptome, proteome and metabolome analysis. The objective is to develop an appreciation for the challenges of producing data.

Restriction(s): Instructor's Consent

BINF*6210 Software Tools for Biological Data Analysis and Organization F [0.50]

The objective of this course is to familiarize students with the tools for the computational acquisition and analysis of molecular biological data. Lectures will focus on key software for gene expression analyses, biological sequence analysis, and data acquisition and management. Laboratory exercises will guide students through application of tools relevant to topics discussed in lecture.

Prerequisite(s): Introductory molecular biology or genetics course, undergraduate statistics course
Restriction(s): Instuctor's Consent

BINF*6410 Algorithms and Programming in Bioinformatics W [0.50]

This course will teach students to develop and use programming tools for bioinformatics. The topics covered present a recourse for bioinformaticians who find that existing software does not satisfy their needs.

Prerequisite(s): BINF*6210

BINF*6420 Biosequence Pattern Analysis W [0.50]

This course is an overview course on different approaches to analyze biological sequences. Basic concepts are introduced, as well as related algorithms.

Prerequisite(s): BINF*6210

BINF*6970 Statistical Bioinformatics W [0.50]

This course presents a selection of advanced approaches for the statistical analysis of data that arise in bioinformatics, especially genomic data. A central theme to this course is the modelling of complex, often high-dimensional, data structures.

Prerequisite(s): Introductory courses in statistics, mathematics and programming
Restriction(s): Instructor's Consent

BINF*6998 Bioinformatics Diploma Project F,W,S [0.50]

A research paper is completed by students taking the Graduate Diploma in Bioinformatics program.

Prerequisite(s): BINF*6110, BINF*6210
Restriction(s): Instructor's Consent

BINF*6999 Bioinformatics Master's Project F,W,S [1.00]

A major research paper is completed by students in the Master of Bioinformatics program.

Prerequisite(s): BINF*6110, BINF*6210
Restriction(s): Instructor's Consent

Biomedical Science

BIOM*6060 Functional Neuroanatomy U [0.50]

A course emphasizing the structure and function of the mammalian nervous system and organs of special sense.

BIOM*6070 Pregnancy, Birth and Perinatal Adaptations S [0.50]

This course promotes understanding of the physiology of the placenta, and its role in fetal, perinatal and adult health. It is offered through videoconference involving University of Guelph, Queen's University and University of Waterloo. Parts are customized to student's interests within pregnancy physiology.

BIOM*6110 Advanced Microscopy for Biomedical Sciences U [0.50]

Routine and specialized procedures for light microscopy, and transmission and scanning electron microscopy are examined through lectures, discussions and practical exercises. Interpretation of micrographs is included.

BIOM*6130 Vertebrate Developmental Biology U [0.50]

The principles of vertebrate development are examined through lectures, discussions and practical exercises. Topics include aspects of gametogenesis, fertilization, implantation, embryonic and fetal development and experimental manipulation of embryos. Emphasis is on mammalian development and topics may vary depending on student needs and interests.

BIOM*6160 Cellular Biology U [0.50]

An integrative course that examines aspects of cell biology in the context of recent research advancements. Topics are chosen based on student interest and faculty expertise and are explored through a combination of lectures, student seminars and group discussions.

BIOM*6190 Tissue Culture Techniques in Biomedical Sciences U [0.50]

An introduction to in vitro techniques examining aspects and principles of the culture environment, isolation methods, propagation, characterization and storage of cultured cells, gametes and embryos. Practical exercises and student assignments complement material presented in lecture and seminar format.

BIOM*6440 Biomedical Toxicology U [0.50]

The course examines chemical compounds injurious to animals and man, toxicity testing, teratogens, carcinogens, factors influencing toxicity, and toxic drug interactions. The mechanism of action, metabolism, and principles of antidotal treatment are also studied.

BIOM*6480 Pharmacodynamics and Pharmacokinetics U [0.50]

This course describes drug absorption, distribution, biotransformation and elimination in animals and human beings, and emphasizes factors which modify drug behaviour. It integrates molecular mechanisms with physiological processes and highlights the importance of receptors and second messengers in cellular responses to pharmacologic agents.

BIOM*6570 Biochemical Regulation of Physiological Processes U [0.50]

This course focuses on the regulation of vertebrate physiological processes, such as electrolyte and water balance, temperature regulation, growth and energy metabolism, by hormones and other biological regulators that act through cellular receptors and intracellular biochemical-control pathways.

BIOM*6601 Special Topics in Reproductive Biology and Biotechnology U [0.25]

Permits in-depth exploration of interdisciplinary aspects of biomedical research. Topics such as inflammation, reproductive immunology and neoplasia have been offered.

BIOM*6602 Special Topics in Reproductive Biology and Biotechnology U [0.50]

See BIOM*6601 above.

BIOM*6610 Vascular Biology U [0.50]

An interdisciplinary course in which the interrelationships between vascular proteins, cellular elements and the maintenance of vascular integrity are examined. Structural-functional relationships in vascular biology are explored through seminar presentations, group discussions and small group participation in problem based examples of vascular dysfunction.

BIOM*6701 Special Topics in Development, Cell and Tissue Morphology U [0.25]

Permits further in depth study of developmental and morphological sciences.

BIOM*6702 Special Topics in Development, Cell and Tissue Morphology U [0.50]

See BIOM*6701

BIOM*6711 Special Topics in Physiology & Biochemistry U [0.25]

This course involves an appropriate combination of an experimental procedure (or project), seminars, selected reading or a literature review outside the thesis subject, developed according to the student's requirements.

BIOM*6712 Special Topics in Physiology & Biochemistry U [0.50]

See BIOM*6711

BIOM*6721 Special Topics in Pharmacology-Toxicology U [0.25]

This course will comprise a combination of an experimental procedure (or project), seminars, selected reading or a literature review outside the thesis subject, developed based on the student's requirements. Topics could include clinical pharmacology/toxicology, pharmaco-epidemiology/economics, gerontological or perinatal pharmacology and toxicokinetics. Department of Biomedical Sciences

BIOM*6722 Special Topics in Biomedical Pharmacology-Toxicology U [0.50]

See BIOM*6721

BIOM*6800 Gene Expression in Health and Disease W [0.50]

This course presents the molecular concepts of gene expression and the functional consequences of abnormal expression in pathological conditions. The conceptual, methodological and applied aspects of gene expression will be illustrated through student and faculty seminars, written reports, group discussions, and debates.

Restriction(s): Instructor's signature required

BIOM*6900 Research Project in Biomedical Sciences W,S,F [1.00]

This course will be a lab-based, two-semester research project course for students in the course-based MSc stream in Biomedical Sciences.

Biophysics

BIOP*6000 Concepts in Biophysics W [0.50]

This course will emphasis basic concepts in molecular, cellular and structural biophysics arising from key journal publications and their impact on present day research trends.

BIOP*6010 Biophysics Seminar U [0.00]

Public research seminar presented by all PhD students in the Biophysics program in yearly intervals after passing the qualifying exam. Students are required to attend all seminars presented during the semester in which they are registered for the course.

BIOP*6100 Scientific Communication and Research Methods in Biophysics U [0.50]

The development and refinement of the skills of scientific communication, emphasizing oral presentation and writing skills, in the context of developing a literature review or thesis proposal. All Biophysics students will normally take this within 4 semesters of entering the program.

BIOP*6950 Advanced Topics in Biophysics U [0.50]

This course provides opportunities for graduate students to study special topics in contemporary biophysical research under the guidance of graduate faculty members with pertinent expertise. Proposed course descriptions are considered by the Director of the Biophysics program on an ad hoc basis, and the course will be offered according to demand.

Business

BUS*6130 General Environment of Business W [0.50]

The objective of this course is to assist managers to better understand and develop strategies for dealing with their political and economic environments. This course has a comprehensive and international perspective that looks at how Canadian industries and businesses are part of a worldwide economics and political system. This course provides a detailed examination of how specific policies affect business and strategy in different industries for different commodities.

Restriction(s): CME Executive Programs Students

BUS*6180 Financial and Managerial Accounting F [0.50]

This course emphasizes the gathering and use of financial information to facilitate effective financial and management decisions. Cases are used to approach the subject from the perspective of the user of accounting information rather than that of the supplier.

BUS*6200 Financial Management W [0.50]

This course takes the viewpoint of the senior financial officer of a commercial enterprise. The focus is on the management of cash, accounts receivable, inventories and capital assets, as well as on the sourcing of funds through short-term liabilities, long-term debt and owners' equity.

Prerequisite(s): BUS*6180
Restriction(s): Non MBA students only by permission of instructor.

BUS*6800 Readings in Leadership I F,W,S [0.50]

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

BUS*6810 Readings in Leadership II F,W,S [0.50]

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

Prerequisite(s): BUS*6800 (or may be taken concurrently)

BUS*6820 Readings in Management F,W,S [0.50]

This course is available to individuals or groups of graduate students. Students will complete a set of readings and an associated paper as approved by designated faculty. Specific learning objectives consistent with the University's will be developed each time the course is offered.

Capacity Development and Extension

CDE*6070 Foundations of Capacity Building and Extension U [0.50]

Contemporary issues and changes in rural communities and the implications for building community capacity. Students will be introduced to and examine dominant paradigms of community capacity building for meeting rural needs.

CDE*6260 Research Design U [0.50]

Provides students with abilities and knowledge to undertake, formulate and implement research in their chosen area of development. Students are expected to acquire the ability to identify research question and the appropriate designs to answer such questions.

CDE*6290 Special Topics in Capacity Building and Extension U [0.50]

Selected study topics which may be pursued in accordance with the special needs of students in the program.

CDE*6311 Community Engagement and Public Participation U [0.50]

This course will explore the philosophy and principles of public participation. An emphasis will be placed on those practices and methods that can be used to engage communities and organizations within a participatory framework.

Prerequisite(s): CDE*6070

CDE*6320 Capacity Building for Sustainable Development U [0.50]

Learning processes enhancing human capital in civil society and the organizational and managerial capabilities that can empower communities to meet their economic, social, cultural and environmental needs. Examines development and underdevelopment and the role of non-formal education and administration in facilitation social change in peripheral regions from an interdisciplinary perspective.

CDE*6330 Facilitation and Conflict Management U [0.50]

Explore the theories of leadership, practice leadership skills and activities, and develop an understanding of the role facilitation and conflict management play in organizational success. Emphasizes personal individual development through practice, lecture and group discussion. Service learning through facilitation of community meetings will be part of the course.

CDE*6410 Readings in Capacity Building and Extension U [0.50]

A program of supervised independent study related to the student's area of concentration.

Restriction(s): Instructor's signature required.

CDE*6420 Communication for Social and Environmental Change U [0.50]

Communication process for social change and development including participatory media. Students engage in community-based work involving multi-media projects. Course covers the history of development communication and current praxis in Canada and internationally.

Restriction(s): Instructor's signature required.

CDE*6690 Community Environmental Leadership F [0.50]

This course explores the relationships between the environment and socio-economic issues at the community level and the resulting conflict. Using the social change model, this ecourse examines the linages between advocacy, decision-making and conflict and the development of strategies to mitigate community confict.

Restriction(s): Instructor's signature required.

CDE*6900 Major Research Paper U [1.00]

Students select a topic and write a paper that does not necessarily include original data but is an analysis and synthesis of materials dealing with the topic selected.

Restriction(s): Instructor's signature required.

Chemistry

CHEM*7100 Selected Topics in Inorganic Chemistry U [0.50]

Discussion of specialized topics related to the research interests of members of the centre. Special topics could include, for example: bioinorganic chemistry; inorganic reaction mechanisms; synthetic methods in inorganic and organometallic chemistry; homogeneous and heterogeneous catalysis; chemistry of polynuclear compounds.

CHEM*7120 X-ray Crystallography U [0.50]

Introduction: crystals, basic concepts; space groups: the reciprocal lattice; x-ray diffraction; the phase problem; structure factors; electron density; small molecule structure solution, structure refinement, structure results, journals and databases, paper writing.

CHEM*7130 Chemistry of Inorganic Solid State Materials U [0.50]

Introduction to solid state chemistry, common crystal structures, principles of solid state synthesis, theory and experimental methods for characterizing solids, including thermal analysis techniques, powder x-ray and neutron diffraction methods; special topics to include one or more of the optical, electronic, magnetic, or conductive properties of inorganic materials. Prerequisites: one semester-long undergraduate course (at least third-year level) in inorganic chemistry, preferably with content in structural and/or solid state.

CHEM*7150 Structure and Bonding in Inorganic Chemistry U [0.50]

Free electron, Hueckel and extended Hueckel methods for molecules and clusters. Perturbation theory. Applications of group theory in inorganic chemistry; Jahn-Teller effects in molecules and solids. Energy bands in one, two and three dimensions. Prerequisites: three semester-long undergraduate courses in inorganic chemistry and one semester-long undergraduate course in quantum mechanics or group theory.

CHEM*7170 Advanced Transition Metal Chemistry U [0.50]

Magnetochemistry of transition metal compounds. Electronic spectra of complex ions including applications of molecular orbital and ligand field theories. Stabilization of unusual oxidation states and co-ordination numbers. Bonding, structure and reactivity of certain important classes of metal complexes, e.g., metal hybrides, metal-metal bonded species, biologically significant model systems such as macrocycles.

CHEM*7180 Advanced Organometallic Chemistry U [0.50]

Reactions, structure and bonding of organometallic compounds of transition and non-transition metals.

CHEM*7200 Selected Topics in Analytical Chemistry U [0.50]

Special topics could include, for example: trace analysis using modern instrumental and spectroscopic methods; advanced mass spectrometry (instrumentation and interpretation of spectra); analytical aspects of gas and liquid chromatography.

CHEM*7240 Chemical Instrumentation U [0.50]

Instrumental components and optimum application; rudiments of design; electrical, spectral, migrational and other methods.

CHEM*7260 Topics in Analytical Spectroscopy U [0.50]

Atomic emission and absorption spectroscopy; methods of excitation and detection; quantitative applications. Molecular electronic spectroscopy, UV, visible and Raman; instrumental characteristics; applications to quantitative determinations, speciation, measurements of equilibrium, etc. Sources and control of errors and interferences. Determination and description of colour.

CHEM*7270 Separations U [0.50]

Material to be covered is drawn from the following topics: diffusion; isolation of organic material from the matrix; chromatographic techniques - principles of chromatographic separation, gas (GLC, GSC), liquid (LLC, LSC, GPC, IEC), supercritical fluid (SFC) chromatographies; GC-MS, CG-FTIR; electrophoresis, flow field fractionation. Prerequisites: undergraduate level course in instrumental analysis.

CHEM*7280 Electroanalytical Chemistry U [0.50]

A study of electroanalytical techniques and their role in modern analytical chemistry. The underlying principles are developed. Techniques include chronamperometry, chronocoulometry, polarography, voltammetry, chronopotentiometry, coulometric titrations, flow techniques, electrochemical sensors and chemically modified electrodes.

CHEM*7290 Surface Analysis U [0.50]

CHEM*7300 Proteins and Nucleic Acids U [0.50]

Determination of protein sequence and 3-dimensional structure, protein anatomy; prediction of protein structure; intermolecular interactions and protein-protein association; effects of mutation. Nucleic acid structure and anatomy; DNA and chromatin structure; RNA structure; snRNPs and ribozymes; protein-nucleic acid interactions.

CHEM*7310 Selected Topics in Biochemistry U [0.50]

Discussion of specialized topics related to the research interests of members of the centre: for example, recent offerings have included peptide and protein chemistry, biochemical toxicology, medical aspects of biochemistry, glycolipids and glycoproteins, redox enzymes, biological applications of magnetic resonance, etc. Department of Chemistry

CHEM*7360 Regulation in Biological Systems U [0.50]

Mechanisms of regulation of metabolism - enzyme clusters; phosphorylation and protein kinases/phosphatases, repression and induction, protein turnover. Regulation of transcription, translation and mRNA processing. Cell cycle and control of cell division.

CHEM*7370 Enzymes U [0.50]

Mechanisms of rate enhancement. Enzyme kinetics - steady state; inhibitors; bisubstrate enzymes; fast reaction kinetics. Enzyme reaction mechanisms. Structural and genetic modification of enzymes. Catalytic antibodies. Binding processes. Multiple sites and co-operativity. Allosteric enzymes and metabolic control. Catalysis by RNA.

CHEM*7380 Cell Membranes and Cell Surfaces U [0.50]

Membrane proteins and lipids - structure and function; dynamics; techniques for their study; model membrane systems. Membrane transport. The cytoskeleton. Membrane protein biogenesis, sorting and targeting. Signal transduction across membranes. The cell surface in immune responses.

CHEM*7400 Selected Topics in Theoretical Chemistry U [0.50]

Discussion of specialized topics related to the research interests of the members of the centre. Special topics could include for example: theory of intermolecular forces; density matrices; configuration interaction; correlation energies of open and closed shell systems; kinetic theory and gas transport properties; theory of the chemical bond.

CHEM*7450 Statistical Mechanics U [0.50]

Review of classical and quantum mechanics; principles of statistical mechanics; applications to systems of interacting molecules; imperfect gases, liquids, solids, surfaces and solutions.

CHEM*7460 Quantum Chemistry U [0.50]

Approximate solutions of the Schrodinger equation and calculations of atomic and molecular properties.

CHEM*7500 Selected Topics in Physical Chemistry U [0.50]

Discussion of specialized topics related to the research interests of the members of the centre. Special topics could include for example: principles of magnetic resonance in biological systems; collisions, spectroscopy and intermolecular forces, surface chemistry; catalysis; electrolyte theory; non-electrolyte solution theory, thermodynamics of biological systems; thermodynamics.

CHEM*7550 Kinetics - Dynamics U [0.50]

Empirical analysis. Kinetic theory of gases. Potential energy surfaces. Unimolecular rates. Relaxation and steady state methods. Diffusion rates. Rates between polar molecules. Energy transfer.

CHEM*7560 Spectroscopy U [0.50]

Aspects of electronic vibrational and rotational spectroscopy of atoms, molecules, and the solid state. Relevant aspects of quantum mechanics, Dirac notation, and angular momentum will be discussed. Group Theory will be presented and its implications for spectroscopy introduced. Prerequisites: one semester-long undergraduate course in quantum mechanics or the approval of the instructor.

CHEM*7600 Selected Topics in Organic Chemistry U [0.50]

Two or three topics from a range including: bio-organic chemistry; environmental organic chemistry; free radicals; heterocyclic molecules; molecular rearrangements; organometallic chemistry; photochemistry; natural products. Department of Chemistry

CHEM*7640 Synthetic Organic Reactions U [0.50]

Named organic reactions and other synthetically useful reactions are discussed. The mechanism, stereochemical implications and use in organic synthesis of these reactions will be presented. Examples from the organic literature will be used to illustrate these aspects.

CHEM*7650 Strategies in Organic Synthesis U [0.50]

The synthesis of organic compounds is discussed and emphasis is placed on the design of synthetic routes. Examples drawn from the literature are used to illustrate this synthetic planning.

Prerequisite(s): CHEM*7640

CHEM*7660 Organic Spectroscopy U [0.50]

Ultraviolet, infrared, resonance spectroscopy and mass spectrometry, with emphasis on applications to studies of organic molecules.

CHEM*7690 Physical Organic Chemistry U [0.50]

Linear free energy relationships; substituent effects and reactive intermediates.

CHEM*7700 Principles of Polymer Science U [0.50]

Introduction to the physical chemistry of high polymers, principles of polymer synthesis, mechanisms and kinetics of polymerization reactions, copolymerization theory, polymerization in homogeneous and heterogeneous systems, chemical reactions of polymers. Theory and experimental methods for the molecular characterization of polymers.

CHEM*7710 Physical Properties of Polymers U [0.50]

The physical properties of polymers are considered in depth from a molecular viewpoint. Rubber elasticity, mechanical properties, rheology and solution behaviour are quantitatively treated.

Prerequisite(s): CHEM*7700 or equivalent

CHEM*7720 Polymerization and Polymer Reactions U [0.50]

The reactions leading to the production of polymers are considered with emphasis on emulsion and suspension polymerization and polymerization reaction engineering. Polymer degradation, stabilization and modification reactions are also considered in depth.

Prerequisite(s): CHEM*7700 or equivalent.

CHEM*7730 Selected Topics in Polymer Chemistry U [0.50]

Discussion of specialized topics of polymer chemistry related to the research interests of the faculty or prominent scientific visitors. Special topics could include, for example: polymer stabilization and degradation; mechanical properties; polymer principles in surface coatings; organic chemistry of synthetic high polymers; estimation of polymer properties; reactions of polymers; polymerization kinetics.

CHEM*7940 MSc Seminar U [0.50]

A written literature review and research proposal on the research topic will be presented and defended in a 30-minute public seminar. This requirement is to be completed by all thesis-option MSc students within two semesters of entering the program.

CHEM*7950 PhD Seminar U [0.00]

CHEM*7960 Comprehensive Examination U [0.00]

PhD students are required to take an oral examination in their major field. The specific content and format are specified by a centre examining committee. The examination must be first attempted no later than eight months after entering the regular PhD program. For co-op PhD students, the examination must be first attempted no later than four months after their return from the work year.

CHEM*7970 MSc Research Paper U [0.50]

An experimental project normally based on the CHEM*7940 research proposal, supervised by the advisor, taking three to four months to complete. This project may be completed at any time during the student's program, but it must follow CHEM*7940. A written report is required, and a seminar based on the content of the report will be presented. The report must be completed as per the project/thesis guidelines of the University campus on which the student is registered. This course normally will follow the course CHEM*7940 MSc Seminar.

CHEM*7980 MSc Thesis U [0.00]

CHEM*7990 PhD Thesis U [0.00]

Computing and Information Science

CIS*6000 Distributed Systems U [0.50]

The evolution of distributed computer systems. Models for distributed processing. Taxonomy of multiprocessor systems. Interconnection networks. Memory and I/O for distributed architectures. Performance of distributed systems. Architectural issues of distributed systems

CIS*6020 Artificial Intelligence U [0.50]

An examination of Artificial Intelligence principles and techniques such as: logic and rule based systems; forward and backward chaining; frames, scripts, semantic nets and the object-oriented approach; the evaluation of intelligent systems and knowledge acquisition. A sizeable project is required and applications in other areas are encouraged.

CIS*6030 Information Systems U [0.50]

Relational and other database systems, web information concurrency protocols, data integrity, transaction management, distributed databases, remote access, data warehousing, data mining.

CIS*6050 Neural Networks U [0.50]

Artificial neural networks, dynamical recurrent networks, dynamic input/output sequences, communications signal identification, syntactic pattern recognition.

CIS*6060 Bioinformatics U [0.50]

Data mining and bioinformatics, molecular biology databases, taxonomic groupings, sequences, feature extraction, Bayesian inference, cluster analysis, information theory, machine learning, feature selection.

CIS*6070 Discrete Optimization U [0.50]

This course will discuss problems where optimization is required and describes the most common techniques for discrete optimization such as the use of linear programming, constraint satisfaction methods, and genetic algorithms.

CIS*6080 Genetic Algorithms U [0.50]

This course introduces the student to basic genetic algorithms, which are based on the process of natural evolution. It is explored in terms of its mathematical foundation and applications to optimization in various domains.

CIS*6090 Hardware/Software Co-design of Embedded Systems U [0.50]

Specification and design of embedded systems, system-on-a-chip paradigm, specification languages, hardware/software co-design, performance estimation, co-simulation and validation, processes architectures and software synthesis, retargetable code generation and optimization.

CIS*6100 Parallel Processing Architectures U [0.50]

Parallelism in uniprocessor systems, parallel architectures, memory structures, pipelined architectures, performance issues, multiprocessor architectures.

CIS*6120 Uncertainty Reasoning in Knowledge Representation U [0.50]

Representation of uncertainty, Dempster-Schafer theory, fuzzy logic, Bayesian belief networks, decision networks, dynamic networks, probabilistic models, utility theory.

CIS*6130 Object-Oriented Modeling, Design and Programming U [0.50]

Objects, modeling, program design, object-oriented methodology, UML, CORBA, database

CIS*6140 Software Engineering U [0.50]

This course will discuss problems where optimization is required and describes the most common techniques for discrete optimization such as the use of linear programming, constraint satisfaction methods, and meta-heuristics.

CIS*6160 Multiagent Systems U [0.50]

Intelligent systems consisting of multiple autonomous and interacting subsystems with emphasis on distributed reasoning and decision making. Deductive reasoning agents, practical reasoning agents, probabilistic reasoning agents, reactive and hybrid agents, negotiation and agreement, cooperation and coordination, multiagent search, distributed MDP, game theory, and modal logics.

CIS*6200 Design Automation in Digital Systems U [0.50]

Techniques and software tools for design of digital systems. Material covered includes high-level synthesis, design for testability, and FPGAs in design and prototyping.

CIS*6320 Image Processing Algorithms and Applications U [0.50]

Brightness transformation, image smoothing, image enhancement, thresholding, segmentation, morphology, texture analysis, shape analysis, applications in medicine and biology.

CIS*6420 Soft Computing U [0.50]

Neural networks, artificial intelligence, connectionist model, back propagation, resonance theory, sequence processing, software engineering concepts.

CIS*6490 Analysis and Design of Computer Algorithms U [0.25]

The design and analysis of efficient computer algorithms: standard methodologies, asymptotic behaviour, optimality, lower bounds, implementation considerations, graph algorithms, matrix computations (e.g. Strassen's method), NP-completeness.

CIS*6650 Topics in Computer Science I U [0.50]

This special topics course examines selected, advanced topics in computer science that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor.

CIS*6660 Topics in Computer Science II U [0.50]

This is a reading course. Its aim is to provide background knowledge to students who need to get a head-start in their thesis research fields early during their program while no suitable regular graduate courses are offered. Admission is under the discretion of the instructor.

Restriction(s): Requires instructor's signature.

CIS*6890 Technical Communication and Research Methodology U [0.50]

This course aims to develop students' ability in technical communication and general research methodology. Each student is expected to present a short talk, give a mini lecture, review a conference paper, write a literature survey and critique fellow students' talks and lectures.

Clinical Studies

CLIN*6010 Clinical Medicine F [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

CLIN*6030 Clinical Medicine W [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

CLIN*6031 Clinical Medicine S [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty commonly occurring in the Fall (F), Winter (W), and Summer (S) semesters respectively.

CLIN*6170 Clinical Surgery F [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in Fall (F), Winter (W), and Summer (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

CLIN*6180 Clinical Surgery W [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in Fall (F), Winter (W), and Summer (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

CLIN*6181 Clinical Surgery S [0.50]

These are in-service clinical training courses based on case material presented to the student in the Veterinary Teaching Hospital. Under supervision, the student is expected to take primary responsibility for case management including decisions related to diagnosis, therapy and client/referring veterinarian communications. Case material studied in each course reflects a different clinical subspecialty occurring in Fall (F), Winter (W), and Summer (S) semesters respectively. The student is required to prepare a paper for publication in a recognized peer review journal based on clinical case material presented to the teaching hospital. As an alternative, the paper can be an in-depth review article on a clinically relevant topic.

CLIN*6190 Neurology F [0.50]

Basic principles of lesion localization in the domestic species with discussions of diagnostic problems in veterinary neurology. Offered alternate years.

Restriction(s): Instructor's signature required.

CLIN*6200 Concepts and Application of Infection Control U [0.50]

This course will involve principles of infection control in veterinary hospitals, drawing heavily from information from human medicine and evaluating human information in a veterinary context.

CLIN*6270 Applied Surgical Principles U [0.25]

General surgical principles associated with surgical and related treatment of various body systems. This is an applied course with laboratory and written components. Prerequisite: must have prior surgical training.

CLIN*6310 Advanced Equine Veterinary Orthopaedics U [0.50]

This course will provide the student with an in-depth understanding of orthopaedic practice and will facilitate revision of materials to prepare board certification.

Prerequisite(s): DVM or BSc

CLIN*6330 Advanced Principles of Diagnostic Imaging U [0.50]

This course is intended for students pursuing a career in veterinary radiology. Using a lecture-discussion format, the science of x-ray production and the fundamentals of other diagnostic imaging modalities will be presented. The specific applications of these techniques to research and clinical situations will be investigated.

CLIN*6350 Advanced Radiology I F,W,S [0.50]

Radiographic changes seen in diseases of the thorax and abdomen are demonstrated by using radiographs. Contrast and special studies are included where applicable.

CLIN*6370 Advanced Radiology II F [0.50]

A continuation of CLIN*6350, covering radiographic abnormalities of the neurological and skeletal systems.

CLIN*6380 Electrocardiography in Domestic Animals F,W,S [0.50]

This course will deal with the study of the electrocardiography of the cat, dog, cow and horse. Students will review the mechanisms of arrhythmogenesis and the role of anti-arrhythmic agents in the control of arrhythmogenesis.

CLIN*6420 Anesthesiology I S [0.50]

A course in advanced veterinary anesthesia and allied topics such as fluid, acid-base, and electrolyte balance, shock therapy, and cardio pulmonary resuscitation.

CLIN*6440 Anesthesiology II F,W,S [0.50]

A discussion, reading and investigative course on research methods in comparative anesthesiology.

Prerequisite(s): CLIN*6420 is normally a prerequisite

CLIN*6460 Anesthesiology III: Species Specific and Coexisting Disease Considerations F-W [0.50]

A course in advanced veterinary anesthesia that focuses on the scientific literature related to the anesthesia of specific species and veterinary patients with varying underlying diseases.

Prerequisite(s): DVM; CLIN*6420 and CLIN*6440

CLIN*6550 Small Animal Internal Medicine I F [0.50]

This is a graduate course designed for DVSc students and residents pursuing further study in the area. The basis of the course is the acquisition and application of knowledge of the pathophysiologic mechanisms of disease. Subject areas to be addressed may include: cardiovascular disease, respiratory disease and acid-base-electrolyte abnormalities.

CLIN*6560 Small Animal Internal Medicine II W [0.50]

A continuation of Small Animal Internal Medicine I. Subject areas to be addressed may include: endocrine diseases, pharmacodynamics, renal disease and neurologic disease.

CLIN*6570 Large Animal Internal Medicine I W [0.50]

Advanced study in general medicine and pathophysiologic principles of disorders of the gastrointestinal and urinary systems in ruminants, swine and horses. Offered every third year.

CLIN*6580 Large Animal Internal Medicine II W [0.50]

Advanced study in general medicine and the pathophysiologic principles of disorders of the cardiovascular, respiratory and musculo-skeletal systems of ruminants and horses. Offered every third year.

CLIN*6590 Large Animal Internal Medicine III W [0.50]

Advanced study in general medicine and the pathophysiologic principles of neonatal disorders and disorders of the nervous system, skin and general systemic disorders. Offered every third year.

CLIN*6600 Equine Soft Tissue Surgery I F,W,S [0.50]

Based on required reference reading, every other week discussion will cover advanced soft tissue procedures performed in equine surgery. Guest lectures on selected topics will be presented. Laboratory will be given.

CLIN*6610 Equine Soft Tissue Surgery II F,W,S [0.50]

Based on required reference reading, every other week discussion will cover advanced soft tissue procedures performed in equine surgery. Guest lectures on selected topics will be presented. Laboratory will be given.

CLIN*6620 Ruminant Surgery W [0.50]

Through lectures/seminars, medical and surgical laboratories, and detailed case discussions, this course provides practical experience in ruminant medical, radiological and surgical procedures and in problem-solving related to ruminant practice.

CLIN*6670 Structure & Function of Animal Skin F,W,S [0.50]

A review of structure and function of skin in veterinary dermatology including the epidermis, dermis, subcutis and adnexal tissue. Application of knowledge in a clinical setting will follow with attention to modalities that will improve the epidermal barrier

Restriction(s): Instructor's signature required

CLIN*6680 Readings in Cardiology I F,W,S [0.50]

Original articles, review articles and textbook chapters dealing with the most recent concepts of pathophysiology, diagnostic procedures and therapeutic advancements will be reviewed, analyzed and discussed.

CLIN*6690 Readings in Cardiology II F,W,S [0.50]

Readings in Cardiology II will be a continuation of the format of Readings in Cardiology I with further readings in clinical cardiology.

CLIN*6700 Pathophysiology in Small Animal Surgery I F,W,S [0.50]

Based on required reference reading, weekly discussions will cover the disease mechanisms involved in medical problems commonly encountered in small animal surgical practice. Guest lectures on selected topics will be presented.

CLIN*6710 Pathophysiology in Small Animal Surgery II F,W,S [0.50]

Based on required reference reading, weekly discussions will cover the disease mechanisms involved in medical problems commonly encountered in small animal surgical practice. Guest lectures on selected topics will be presented.

CLIN*6900 Clinical "Grand Rounds" Seminar F-W [0.25]

This course allows each participant the opportunity to present a clinical case to colleagues in the veterinary school. The topic must be approved by the course co-ordinator. The oral presentation will be evaluated, as will the written presentation, which should be in a form suitable for submission to a veterinary journal.

CLIN*6920 Veterinary Clinical Practice I F [0.50]

These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

Restriction(s): Instructor's Consent Required

CLIN*6930 Veterinary Clinical Practice II W [0.50]

These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

Restriction(s): Instructor's Consent Required

CLIN*6940 Veterinary Clinical Practice III S [0.50]

These are in-service clinical training courses for intern/graduate-diploma students based on case material presented to the Veterinary Teaching Hospital. Under supervision, the intern/graduate-diploma student, as part of a service team with a faculty clinician, is expected to hone his/her diagnostic, therapeutic and surgical skills, and gain experience with animal restraint and nursing care. They will also develop a problem-oriented approach to health management and disease. Case material studied in each course reflects the clinical problems commonly occurring in the Fall, Winter and Summer semesters respectively.

Restriction(s): Instructor's Consent Required

CLIN*6950 Special Topics in Clinical Studies F,W,S [0.50]

CLIN*6990 Project in Clinical Studies F,W,S [0.50]

This course involves participation in a clinical research project or clinical retrospective study. A review of the relevant literature will be performed. A manuscript suitable for publication in a peer-reviewed journal will be prepared, and the study will be presented in a departmental seminar.

Restriction(s): Only available to students enrolled in the MSc by Coursework Program.

Creative Writing

CRWR*6000 Plenary Course: Writers on Writing F [0.50]

This required plenary course addresses important historical and contemporary perspectives on creative writing as an art, a practice, and a profession. Readings, discussion and visits from writers and other literary professionals will help students to articulate effectively their own literary aesthetic and to develop professional skills.

Restriction(s): MFA.CW students only

CRWR*6010 Plenary Course: Writers in the World F [0.50]

This required plenary course addresses changing and conflicting ideas about the responsibilities of the writer in the world. Readings, discussion, and visits from writers and other literary professionals will help students to articulate effectively their own positions and to develop professional skills.

Restriction(s): MFA.CW students only

CRWR*6100 Poetry Workshop F-W [0.50]

The Poetry Workshop engages students in an intensive program of reading and writing work. The workshops will be strongly focused on writing and on responding to the work of students in the course with productive, constructive criticism. Students will have the opportunity to work closely with a nationally recognized poet to develop their own skills as poets and editors. Students are expected to read widely and to develop their understanding of the technical aspects of their craft.

Restriction(s): MFA.CW students only

CRWR*6200 Fiction Workshop F-W [0.50]

The Fiction Workshop engages students in an intensive program of reading and writing work. The workshops will be strongly focused on writing and on responding to the work of students in the course with productive, constructive criticism. Students will have the opportunity to work closely with a nationally recognized author to develop their skills as writers and editors. Students are expected to read widely and to develop their understanding of the technical aspects of their craft.

Restriction(s): MFA.CW students only

CRWR*6300 Drama Workshop U [0.50]

The Drama Workshop engages students in an intensive program of writing and reading work. Students will produce a substantial amount of dramatic writing and will also provide constructive criticism of the work of other workshop participants. Required reading will cover a wide range of dramatic literature and the study of dramatic forms and techniques.

Restriction(s): MFA.CW students only

CRWR*6400 Practicum in Creative Writing U [0.50]

In this course of guided study, the student will work on a creative project with a mentor who is a recognized member of the professional writing community.

Restriction(s): MFA.CW students only

CRWR*6500 Non-Fiction Workshop U [0.50]

The Non-Fiction Workshop engages students in a reading and writing intensive program of creative non-fiction. The workshops will be strongly focused on writing and will involve the creation and revision of a substantial body of new work in the genre, as well as critiquing the work of other students in the course. The reading component will focus on texts from a varied social and cultural range (e.g. family memoir, travel narrative, cultural memoir, themed meditation).

Restriction(s): MFA.CW students only

CRWR*6600 Special Topics in Creative Writing U [0.50]

A variable-content course focusing on a particular issue or approach to writing within one genre of creative writing (fiction, poetry, drama, etc.) or a particular issue or approach to writing that is at work across multiple genres.

Criminology and Criminal Justice Policy

CCJP*6000 Courts W [0.50]

This course examines courts from a variety of political, social, and socio-legal perspectives depending on the interest of the instructor(s). Particular attention will be paid to the role of courts in shaping criminal justice policy through such means as constitutional decisions and sentencing decisions.

Restriction(s): CCJP students. Instructor's signature required if not in the CCJP program

CCJP*6100 Governing Criminal Justice F [0.50]

This course analyzes criminal justice policy and governance of the criminal justice system from applied and theoretical perspectives. Particular attention is paid to the interplay between criminal justice policy and management and the larger political process.

Restriction(s): CCJP students

CCJP*6300 Research Methods in Criminal Justice F [0.50]

This course introduces students to the primary methods, data sources and statistical methods used in criminal justice and criminology research. Particular attention will be paid to the role research and methods and statistics play in shaping criminal justice/criminological theory, research and policy.

Restriction(s): CCJP students or instructor's signature

CCJP*6660 Major Research Paper S,F,W [1.00]

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters.

Restriction(s): Restricted to CCJP graduate students

Economics

ECON*6000 Microeconomic Theory I U [0.50]

A first graduate course in microeconomics, presenting a rigorous treatment of consumer theory, producer theory, applications of duality, partial equilibrium, general equilibrium and the fundamental theorems of welfare economics.

ECON*6010 Microeconomic Theory II U [0.50]

Advanced topics in modern microeconomics to include elements of game theory, information economics, economics of risk and uncertainty, the theory of incentives and others.

Prerequisite(s): ECON*6000

ECON*6020 Macroeconomic Theory I U [0.50]

A first graduate course in macroeconomics, presenting a rigorous introduction to the tools and basic models of dynamic general equilibrium theory. The topics covered include economic growth and development, economic fluctuations, and monetary and fiscal policies.

ECON*6040 Macroeconomic Theory II U [0.50]

This course considers the dynamics resulting from intertemporal optimization models. Foundations of unemployment theory. Approaches to business cycles. Models of long-run growth.

Prerequisite(s): ECON*6020

ECON*6050 Introduction to Econometric Methods U [0.50]

Introduction to the specification, estimation and testing of economic models. Topics include the classical linear regression model, t tests, structure tests, specification error, the consequences of the violation of the classical assumptions, detection and correction of autocorrelation and heteroscedasticity.

ECON*6060 Mathematical Methods for Economics F [0.00]

This course is designed to provide students with the necessary mathematical tools to follow the contents of the core economics and econometrics courses in the MA program and successfully complete them. The material covered will include advanced topics in linear algebra, multivariate optimization techniques and comparative statics.

ECON*6090 Game Theory U [0.50]

This course introduces the student to game theory, which is an important tool for modelling economic situations with multi-person interaction. Economic applications such as oligopoly, bargaining, auctions, and public goods provision will be discussed. Broader applicaitons to voting games, candidate strategy, war games, and parlour games will also be briefly discussed. Students need to be very familiar with optimization and single person decision-making.

ECON*6100 Experimental Economics U [0.50]

This course examines the use of the experimental methodology in economics. We will study how experiments have been used to test theories in many subfields within economics. In the process, students will learn how to construct and run economics experiments and analyze experimental data.

ECON*6110 Mathematical Economics U [0.50]

This course introduces students to the mathematical techniques used in advanced economic analysis. Topics covered in any year: analysis of dynamic economic models and optimization in dynamic economic models.

ECON*6140 Econometrics I U [0.50]

Topics include a review of the classical linear regression model, applications of generalized least squares, maximum likelihood methods and various statistical test procedures.

ECON*6160 Econometrics II U [0.50]

Topics include maximum likelihood as a method of estimation and inference, nonlinear estimation and simultaneous equations. Also more specialized topics such as limited-dependent-variable models and non-parametric regression methods may be covered.

ECON*6170 Topics in Econometrics U [0.50]

This is an advanced econometrics topics course that covers the area of non-parametric and semiparametric estimation and testing of econometrics models, including time series and panel data semiparametric models.

ECON*6180 Econometric Methods U [0.50]

This course follows ECON*6050. It covers estimation by instrumental variables, estimations of simultaneous systems, asymptotic distribution theory, maximum likelihood estimation, binary choice and limited dependent variable models, and issues in time series analysis.

ECON*6200 Economic History U [0.50]

This course considers topics in economic history which vary from year to year. The emphasis will be usually on late-19th or 20th century topics and often involves a world emphasis. Student presentations and papers form a large part of the course.

ECON*6300 International Trade Theory U [0.50]

This course provides a rigorous treatment of both positive and normative aspects of trade theory through extensive use of general equilibrium models under varying assumptions. Topics may also include barriers to trade, international factor movements, growth and development, and strategic trade policy.

ECON*6320 International Finance U [0.50]

This course deals with the theoretical policy and issues of international finance. Topics may include exchange rate determination, capital flows in international markets, the financing of trade flows, and open economy macroeconomic models and policy issues.

ECON*6350 Economic Development U [0.50]

This course examines economic development from an international perspective: theories, history, policies and prospects.

ECON*6370 Economic Development in Historical Perspective U [0.50]

This course will examine the experience of economic development focusing on the emergence of the Third World. Topics for discussion will vary from year to year; they may include the impact of trade expansion during the eighteenth and nineteenth centuries, the role of manufacturing as a leading sector, statist vs. the new classical approaches to government policy, and others.

ECON*6380 Financial Economics U [0.50]

This course has three objectives: (i) build a common background for all students in asset pricing and corporate finance in order to facilitate discussion of finance research; (ii) provide an in-depth look at selected finance topics, and (iii) expose students to top published research papers.

ECON*6390 Empirical Finance and Financial Econometrics U [0.50]

This course covers topics in empirical finance, involving the integration of financial theory, financial econometrics, and data analysis. Students will learn how empirical research in finance is conducted through reading involving both textbooks and journal articles and from conducting an independent research project.

Co-requisite(s): ECON*6140

ECON*6400 Public Finance U [0.50]

This course surveys the normative theory of the public sector. Topics may include public expenditure theory, tax theory, cost benefit analysis and fiscal federalism.

ECON*6490 Money and Banking U [0.50]

This course studies monetary economies using overlapping generations models, MIU models and CIA models. More specifically, we will study major issues in money and banking, such as the role of money and banks, the cost of inflation, and the optimal monetary policies.

ECON*6600 Labour Economics U [0.50]

Major themes in labour market theory including static and dynamic labour demand and supply, migration and wage structures and dynamics, unemployment, migration and the role of social programs.

ECON*6610 Topics in Labour Economics U [0.50]

This course complements ECON*6600. Topics include advanced issues in family labour supply, human capital, wage bargaining and contract theory, search theory, duration analysis and its application to major labour market spells such as employment and unemployment.

ECON*6650 Economics of Social Welfare U [0.50]

This course deals with the analysis of social welfare programs, concentrating on national health insurance. It covers their structure, incentives and distribution effects, and includes empirical analysis of existing programs.

ECON*6700 Industrial and Market Organization U [0.50]

The major topics of industrial organization are analyzed from both a game theoretic perspective and from a Structure-Conduct-Performance perspective. Typical topics include: oligopoly theory, determinants of industrial structure, Coase theorem, market entry, advertising, research and development, product differentiation, and price discrimination.

ECON*6750 Managerial Economics U [0.50]

The course introduces students to the latest developments in the economic analysis of the inside workings and organization of firms. The course tries to explain the diversity of economic organizations, and more generally why economic activity is sometimes carried out through firms and sometimes through markets. For graduate students outside the Department of Economics and Finance.

ECON*6770 Financial Management U [0.50]

This course examines the implications of financing decisions made by firms in a world of uncertainty. Topics such as capital budgeting, capital structure, dividend policy, market efficiency and capital asset pricing will be analyzed from the perspective of corporate finance and portfolio management theory. Co-requisite: AGEC*6070. For graduate students outside the Department of Economics and Finance.

ECON*6800 Environmental Economics U [0.50]

A topics course concerning the interrelationships between economic activities and the state of the natural environment. Topics may include: pollution and economic growth; energy use and environmental quality; international trade and pollution; policies for controlling pollution; techniques for assessing the benefits of environmental improvement.

ECON*6810 Economic Theory of Natural Resources Use U [0.50]

This course examines economic models of the use of non-renewable resources to analyze issues such as resource conservation, sustainable development, taxation of resource rents, and price determination in resource markets.

ECON*6930 Reading Course U [0.50]

In some circumstances, students may arrange to take a reading course under the direction of a faculty member.

ECON*6940 Research Project U [1.00]

All students who choose the research project option in the MA program will register in this course. Research projects are written under the direct supervision of a faculty member. Normally, research projects are completed within one or two semesters. Students must make a presentation of their work and a copy of the final report must be submitted to the Department before the final grade is submitted to the Office of Graduate Studies.

Environmental Design and Rural Development

EDRD*6000 Qualitative Analysis in Rural Development U [0.50]

Nature and use of qualitative data collection and analysis techniques by practitioners in the planning, implementation and evaluation of rural planning and development activities in both domestic and international settings.

EDRD*6050 Farming Systems Analysis and Development W [0.50]

An introduction to the Farming Systems Research/Extension approach to solving problems in tropical and sub-tropical agricultural and livestock production systems including problem diagnosis, stakeholder identification and the process of generation, adaption and validation of solutions.

EDRD*6100 Disaster Planning and Management U [0.50]

This course take a multi-hazard perspective and is designed to challenge the students to examine the relationship between disaster and development, to learn how hazards become disasters, as well as the techniques for effective planning and managing disasters from a long-term development perspective. Offered through Distance Format only.

EDRD*6150 Economic Development Policy and Practice for Rural and Smaller Communities U [0.50]

Critically examines the issues and challenges of local economic development policies, programs, planning and practice in North American and European rural and smaller communities. Local and community economic development theories and concepts, comparative case study analysis, community economic analysis (CEA), strategic planning and management. To be offered in distance format only.

EDRD*6630 Regional Planning S [0.50]

An examination of the theory and practice of regional planning in an international and Canadian environment, including a discussion of the various tools available to analysis the regional economy.

EDRD*6690 Program Evaluation U [0.50]

An advanced seminar dealing with the theory and practice of program evaluation focusing on public sector programs in agriculture and rural development, international and domestic case studies.

Engineering

ENGG*6000 Advanced Heat and Mass Transfer F [0.50]

Basic physical principles of transport phenomena. Heat and mass transfer methods for physical systems. Time and volume averaging. Dimensional analysis.

ENGG*6010 Assessment of Engineering Risk W [0.50]

The question of "how safe is safe enough?" has no simple answer. In response, this course develops the bases by which we can assess and manage risk in engineering. Course deals with fate and transport issues associated with risk, as relevant to engineering and how these aspects are employed in the making of decisions.

Prerequisite(s): STAT*2040 or STAT*2120

ENGG*6020 Advanced Fluid Mechanics U [0.50]

Laminar and turbulent flow. Turbulence and turbulence modelling. Boundary-layer flow. Compressible flow. Potential flow.

ENGG*6030 Finite Difference Methods W [0.50]

Numerical solution of partial differential equations of flow through porous media; flow of heat and vibrations; characterization of solution techniques and analysis of stability; convergence and compatibility criteria for various finite difference schemes.

ENGG*6050 Finite Element Methods W [0.50]

Boundary-value problems. Methods of approximation. Time dependent problems. Isoparametric elements. Numerical integration. Computer implementation. Mesh generation and layouts. Two-dimensional finite elements.

ENGG*6060 Engineering Systems Modelling and Simulation U [0.50]

A study of theoretical and experimental methods for characterizing the dynamic behaviour of engineering systems. Distributed and lumped parameter model development. Digital simulation of systems for design and control.

ENGG*6070 Medical Imaging W [0.50]

Digital image processing techniques including filtering and restoration; physics of image formation for such modalities as radiography, MRI, ultrasound.

Prerequisite(s): ENGG*3390 or equivalent

ENGG*6080 Engineering Seminar W [0.00]

The course objective is to train the student in preparing, delivering and evaluating technical presentations. Each student is required to: (a) attend and write critiques on a minimum of six technical seminars in the School of Engineering; and (b) conduct a seminar, presenting technical material to an audience consisting of faculty and graduate students in the school. This presentation will then be reviewed by the student and the instructor.

ENGG*6090 Special Topics in Engineering W [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas which are applicable to several of the engineering disciplines in the School of Engineering.

ENGG*6100 Machine Vision F [0.50]

Computer vision studies how computers can analyze and perceive the world using input from imaging devices. Topics covered include image pre-processing, segmentation, shape analysis, object recognition, image understanding, 3D vision, motion and stereo analysis, as well as case studies.

ENGG*6110 Food and Bio-Process Engineering W [0.50]

Kinetics of biological reactions, reactor dynamics and design. Food rheology and texture; water activity and the role of water in food processing; unit operations design-thermal processing; and drying, freezing and separation processes.

ENGG*6120 Fermentation Engineering F [0.50]

Modelling and design of fermenter systems. Topics include microbial growth kinetics, reactor design, heat and mass transfer. Instrumentation and unit operations for feed preparation and product recovery. Prerequisite: undergraduate course in each of microbiology, heat and mass transfer, and biochemistry or bioprocess engineering.

ENGG*6130 Physical Properties of Biomaterials F [0.50]

Rheology and rheological properties. Contact stresses between bodies in compression. Mechanical damage. Aerodynamic and hydro-dynamic characteristics. Friction.

ENGG*6140 Optimization Techniques for Engineering W [0.50]

This course serves as a graduate introduction into combinatorics and optimization. Oprimization is the main pillar of Engineering and the performance of most systems can be improved through intelligent use of optimization algorithms. Topics to be covered: Complexity theory, Linear/Integer Programming techniques, Constrained/Unconstrained optimization and Nonlinear programming, Heuristic Search Techniques such as Tabu Search, Genetic Algorithms, Simulated Annealing and GRASP.

ENGG*6150 Bio-Instrumentation W [0.50]

Instrumentation systems. Transducers. Amplifier circuits. Recording methods. Spectroscopy & colorimetry. Radiation, humidity, pH and noise measurements. Chromatography.

Restriction(s): ENGG*3450 or equivalent.

ENGG*6160 Advanced Food Engineering F [0.50]

Application of heat and mass transfer, fluid flow, food properties, and food- processing constraints in the design and selection of food process equipment. Development of process specifications for the control of the flow of heat and moisture and the associated microbial, nutritional and organoleptic change in foods. Food system dynamics and process development.

ENGG*6170 Special Topics in Food Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of food engineering.

ENGG*6180 Final Project in Biological Engineering U [1.00]

A project course in which a problem of advanced design or analysis in the area of biological engineering is established, an investigation is performed and a final design or solution is presented.

Restriction(s): This course is open only to students in the biological MEng program.

ENGG*6190 Special Topics in Biological Engineering W [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of biological engineering.

ENGG*6290 Special Topics in Agricultural Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of agricultural engineering.

ENGG*6300 Research Methods in Bioengineering W [0.50]

Research methodologies used in bioengineering are reviewed and assessed in the context of a diverse range of applications: biomechanics, control and instrumentation, ergonomics, diagnostic tools, biomaterials and food safety. The scientific method is discussed in terms of defining research problems, appropriate tests and hypotheses, experimental methods, data analysis and drawing conclusions. The objective is to guide students as they develop a coherent research proposal and deepen their understanding of the breadth of the discipline. (Offered in alternate years)

Restriction(s): Instructor's signature required

ENGG*6440 Advanced Biomechanical Design F [0.50]

Biomechanical Design from concept through prototyping and testing. This course will investigate and apply techniques used for biomechanical design including reverse engineering, solid modelling, geometric tolerancing, testing and rapid prototyping. Instructor's signature required.

ENGG*6450 Queueing Theory & Traffic Modeling in Data Networks F [0.50]

Network traffic modeling. Transient and steady-state analysis of Markov chains. Queueing analysis. Admission and access control. Flow control protocols. Congestion control. End-to-end performance bounds analysis.

Restriction(s): Engineering graduate students or consent of instructor.

ENGG*6660 Renewable Energy U [0.50]

The engineering principles of renewable energy technologies including wind, solar, geothermal and biomass will be examined, including technology-specific design, economic and environmental constraints. Students will compare the relative merits of different energy technologies and gain a knowledge base for further study in the field.

Restriction(s): Engineering graduate students or consent of instructor.

ENGG*6500 Introduction to Machine Learning W [0.50]

The aim of this course is to provide students with an introduction to algorithms and techniques of machine learning particularly in engineering applications. The emphasis will be on the fundamentals and not specific approach or software tool. Class discussions will cover and compare all current major approaches and their applicability to various engineering problems, while assignments and project will provide hands-on experience with some of the tools.

ENGG*6510 Analog Integrated Circuit Design F [0.50]

In this course, operating principles and design techniques of analog integrated circuits are introduced with emphasis on device and system modelling. These circuits include analog and switched-capacitor filters, data converters, amplifiers, oscillators, modulators, circuits for communications, sensor readout channels, and circuits for integrated memories.

Prerequisite(s): ENGG*3450 or equivalent.

ENGG*6520 VLSI Digital Systems Design U [0.50]

This course will introduce the principles of VLSI MOSFET digital design from a circuit and system perspective. Advanced topics include: power issues related to each level of design abstraction; voltage and frequency scaling; power to speed trade offs; ASIC digital design flow; Verilog intergration, ASIC case studies.

Prerequisite(s): ENGG*3450 or equivalent.

ENGG*6530 Reconfigurable Computing W [0.50]

This course serves as a graduate introduction into reconfigurable computing systems. It introduces students to the analyses, synthesis and design of embedded systems and implementing them using Field Programmable Gate Arrays. Topics include: Programmable Logic devices, Hardware Description Languages, Computer Aided Design Flow, Hardware Accelerators, Hardware/Software Co-design techniques, Run Time Reconfiguration, High Level Synthesis.

Prerequisite(s): ENGG*2410 or equivalent.

ENGG*6540 Advanced Robotics W [0.50]

This course is intended for graduate students who have some knowledge and interest in robotics. The course covers modelling, design, planning control, sensors and programming of robotic systems. In addition to lectures, students will work on a term project in which a problem related to robotics systems will be studied. Instructors signature required.

ENGG*6550 Intelligent Real-Time Systems W [0.50]

Soft real-time systems, hard real-time systems, embedded systems, time handling and synchronization, deadlines, preemption, interruption, rts languages, rts/ operating systems, system life-cycle, petri nets, task scheduling and allocation, fault-tolerance, resource management, rts/search techniques, dealing with uncertainty.

ENGG*6560 Advanced Digital Signal Processing W [0.50]

Discrete-time signals and systems, z transform, frequency analysis of signals and systems, fourier transform, fast fourier transform, design of digital filters, signal reconstruction, power spectrum estimation.

ENGG*6570 Advanced Soft Computing F [0.50]

Neural dynamics and computation from a single neuron to a neural network architecture. Advanced neural networks and applications. Soft computing approaches to uncertainty representation, multi-agents and optimizastion.

Prerequisite(s): ENGG*4430 or equivalent

ENGG*6580 Advanced Control Systems F [0.50]

This course will start with state space analysis of multi-input multi-output control systems. Then state space design will be presented. After that, non linear control systems and soft computing based intelligent control systems will be studied. Finally, hybrid control systems, H infinite control and uncertainty and robustness in control systems will be addressed. .

ENGG*6590 Final Project in Engineering Systems and Computing U [1.00]

A project course in which a problem of advanced design or analysis in the area of Engineering Systems and Computing is established by the student, an investigation is performed, and a report on the final design or solution selected is presented.

Restriction(s): This course is only open to students in the engineering systems and computing MEng program.

ENGG*6600 Special Topics in Engineering Systems and Computing U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of Engineering Systems and Computing.

ENGG*6610 Urban Stormwater Management W [0.50]

Continuous stormwater management models and model structure. Catchment discretization and process disaggregation. Pollutant build-up, wash off and transport. Flow and pollutant routing in complex, looped, partially surcharged pipe/channel networks including pond storage, storage tanks, diversion structures, transverse and side weirs, pump stations, orifices, radical and leaf gates and transient receiving water conditions (including tides). Pollutant removal in sewer networks, storage facilities and treatment plants.

ENGG*6620 Water Pollution Control Planning F [0.50]

Methods of developing area-wide pollution control plans and sustainable use plans in Ontario and elsewhere. Quantitative and non-quantitative information is examined in the context of planning, using continuous models such as HSP-F. Field trips.

ENGG*6630 Environmental Contaminants: Fate Mechanisms W [0.50]

Analysis of fate mechanisms associated with environmental contaminants. Focus on substances which are generally considered to be hazardous to humans, or other animal life at low concentrations. Study of physicochemical properties and fate estimation on control and remediation strategies. Quantitative analysis of contaminant partitioning and mass flows, including cross-media transport and simultaneous action of contaminant fate mechanisms.

ENGG*6640 Environmental Contaminants: Control Mechanisms W [0.50]

Analysis of conventional and innovative technologies for toxic contaminants; technologies for contaminated municipal and industrial waste waters, including physical, chemical, and biological treatment processes for trace toxic contaminants in water and wastewater; control technologies for contaminated gas streams, including activated carbon absorption, biofiltration, bioscrubbing, wet scrubbing, thermal- oxidation methods, and process modifications to reduce emissions of toxic air contaminants; remediation techniques for contaminated soil, including external and in-situ physical, chemical and biological treatment methods; cross-media contaminant control issues; toxicity testing and evaluation; relevant regulatory programs.

ENGG*6650 Advanced Air Quality Modelling W [0.50]

Analysis of analytical and computational models used to predict the fate of airborne contaminants; role of air quality models for the solution of engineering-related problems; analysis of important boundary layer meteorology phenomena that influence the fate of air pollutants; conservation equations and mathematical solution techniques; model input requirements such as emissions inventories; Gaussian models; higher-order closure models; Eulerian photochemical grid models.

ENGG*6670 Hazardous Waste Management F [0.50]

This course will define the different types of hazardous wastes that currently exist and outline the pertinent legislation governing these wastes. Information will be presented on different ways to handle, treat and dispose the hazardous waste, including separation, segregation, minimization, recycling and chemical, physical, biological, and thermal treatment. Also to be discussed are hazardous waste landfills and site remediation technologies. Specifics include design and operation of hazardous landfill sites, handling and treatment of leachate, comparison of pertinent soil remediation technologies. Case studies will be reviewed.

ENGG*6680 Advanced Water and Wastewater Treatment F [0.50]

This design course will discuss advanced technologies not traditionally covered during an undergraduate curriculum. An important consideration will be the reuse of water.

ENGG*6690 Non-Point Source Pollution and Its Control F [0.50]

Introduction to issues of non-point source pollution. Modelling of non-point source pollution approaches for vadose zone, surface and subsurface drained water. Scale issues in non- point source modelling. Management issues in non-point source pollution modelling. Application of non-point source pollution models to a variety of situations. Application of non- point source modelling and selection of management approaches for various types of receiving water.

ENGG*6740 Ground Water Modelling U [0.50]

Introduction to current groundwater issues, definition of terms, review of fundamental equations describing fluid and contaminant transport in saturated groundwater zones. Mathematical techniques (analytical, fe and fd) for the solution of the fundamental equations. Application of numerical groundwater models to a variety of situations. Case studies. Review of groundwater models used in industry.

ENGG*6790 Special Topics in Environmental Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of environmental engineering.

ENGG*6800 Deterministic Hydrological Modelling W [0.50]

Deterministic hydrological models. Function of watershed models for hydraulic design, environmental assessment, operation of water control structures, flood warning. Calculation algorithms.

ENGG*6810 Stochastic Hydrological Modelling U [0.50]

Distribution function selection for historic hydrologic data representation. Monte Carlo simulation techniques. ARMA modelling of hydrologic processes. Regional analysis. Risk analysis.

ENGG*6820 Measurement of Water Quantity and Quality U [0.50]

This course covers techniques used to measure rates of movement and amounts of water occurring as precipitation, soil water, ground water and streamflow. Available measurements of water quality are surveyed. Calculation procedures involved in the use of indirect indicators of water quantity and quality individually and in combination are described.

ENGG*6830 Design of Pressurized Flow Systems U [0.50]

Boundary resistance. Steady State and transient flow in gravity and pumped systems. Pressure control systems.

ENGG*6840 Open Channel Hydraulics W [0.50]

Basic concepts, energy principle; momentum principle; flow resistance; non-uniform flow; channel controls and transitions; unsteady flow; flood routing.

ENGG*6850 Design of Water Management Systems U [0.50]

Analytical decision making. Optimization methods. Planning under uncertainty. Deterministic river basin modelling. Irrigation planning and operation. Water quality management modelling.

ENGG*6860 Stream and Wetland Restoration Design W [0.50]

Explores the multi-disciplinary principles of stream and wetland restoration and the tools and techniques for restoration design. Restoration design is approached from a water resources engineering perspective with emphasis on hydrological and hydraulic techniques. Numerous case studies are examined as a means to identify more successful design approaches.

Prerequisite(s): ENGG*3650 or equivalent.

ENGG*6880 Soil Erosion and Fluvial Sedimentation U [0.50]

Students will be able to (i) describe processes related to soil erosion by water, (ii) describe processes related to fluvial sedimentation, (iii) evaluate and prescribe structural and non-structural control methods, and (iv) run at least one soil erosion/fluvial sedimentation computer model if the course is satisfactorily completed.

ENGG*6900 Final Project in Water Resources Engineering U [1.00]

A project course in which an advanced design problem in the area of watershed engineering is established, a feasibility investigation performed and a final design presented.

Restriction(s): This course is open only to students in the water resources MEng program.

ENGG*6910 Special Topics in Water Resources Engineering U [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of water resources engineering.

ENGG*6950 Final Project in Environmental Engineering U [1.00]

A project course in which a problem of advanced design or analysis in the area of environmental engineering is established, an investigation is performed and a final design or solution is presented.

Restriction(s): This course is only open to students in the environmental MEng program.

English

ENGL*6002 Topics in the History of Criticism U [0.50]

This course deals with various aspects of the field of literary criticism, focusing on a specific problem or question each time it is offered. Topics may include the investigation of a specific critical debate - the debate between the Ancients and the Moderns, for instance - or the various ways in which a particular concept - such as didacticism or intentionality - has been treated or is being treated in literary studies.

ENGL*6003 Problems of Literary Analysis U [0.50]

Variable in content and practical in orientation this course seeks to familiarize the student with particular critical techniques and approaches by applying specific examples of those approaches and methods to particular topics (e.g., cultural studies and renaissance literature, discourse analysis and the Victorian novel, computer-mediated analysis and the theatre of the absurd).

ENGL*6201 Topics in Canadian Literature U [0.50]

A course to be offered at least once every academic year. This course in Canadian Literature may focus on cross-genre study or on single genres such as poetry, biography, the short story, literary memoir and/or autobiography, and poetic prose. The focus may be on such topics as the literary and general cultural production of a time-period, an age group (such as children's literature), or a specific region (such as Atlantic Canada, the Prairies, or the West Coast), or may bring together texts from two or more categories to allow for a comparative study. Other possible topics include: post-modernism and the creation of an ex-centric Canadian canon; multiculturalism and the transcultural aesthetics of Canadian writing; the construction and reinvention of a national identity and literature; and literary history, influence, reception and critique.

ENGL*6209 Topics in Colonial, Postcolonial and Diasporic Literature U [0.50]

A course to be offered at least once every academic year. A comparative study of postcolonial literatures in English. Topics may include a focus on a single area, such as India, the Caribbean, Africa, Australia, or New Zealand or may focus on the comparative study of some of these literatures, considering the construction of Third World, diasporic, or settler-invader colonies, or writing and reading practices in colonial, neo-colonial, and postcolonial environments.

ENGL*6412 Topics in Medieval/Renaissance Literature U [0.50]

A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.

ENGL*6421 Topics in Eighteenth Century and Romantic Literature U [0.50]

A examination of the literature of Britain between the 17th century and the latter part of the 18th century. Topics may focus on a single author, a specific genre, or relationships between the literary and the cultural.

ENGL*6431 Topics in Nineteenth Century Literature U [0.50]

A study of the literature of Britain from the late 18th century until the start of the First World War. Topics may focus on a single author, a specific genre, or a central critical question.

ENGL*6441 Topics in Modern British Literature U [0.50]

A study of the literature of Britain in the twentieth century. This course includes a consideration of the interaction between literature and culture in the period - sometimes through the examination of a specific author, sometimes through the study of a particular genre or issue.

ENGL*6451 Topics in American Literature U [0.50]

Topics may include a focus on a single region, such as the American West, on a single time period, such as the Civil War, on a specific genre, such as the novels of frontier women, or other issues in American literary studies.

ENGL*6611 Topics in Women's Writing U [0.50]

In the past the course has dealt with Victorian women poets, with the place of women in the literature of the American West, and with other issues of interest to students of women's writing and the broader issues of feminist theory.

ENGL*6621 Topics in Children's Literature U [0.50]

Past offerings have involved a focus on a specific author - such as Lucy Maud Montgomery - or on a specific kind of writing for or by children.

ENGL*6641 Topics in Scottish Literature U [0.50]

Courses under this rubric are concerned with the various literatures produced by Scots both within and beyond the boundaries of Scotland. The course could involve the study of a specific genre, the investigation of a specific theme, or the examination of a particular author over the course of her/his career.

ENGL*6691 Interdisciplinary Studies U [0.50]

Designed to provide the opportunity to explore alternative fields and modes of critical inquiry, this variable-content course will study the relationship between literary study and other forms of intellectual inquiry such as the relationship between literature and sociology, between critical theory and psychology, between literary history and historical fact.

ENGL*6801 Reading Course I U [0.50]

An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.

ENGL*6802 Reading Course II U [0.50]

An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.

ENGL*6803 Research Project U [1.00]

An independent study course, the content of which is agreed upon between the individual student and the person offering the course. Subject to the approval of the student's advisory committee and the Graduate Committee. This course is designed to provide the student with the opportunity to conduct an extended research project that, while not as complex or as extensive as a thesis, still provides the student with training in research methodology.

ENGL*6811 Special Topics in English U [0.50]

Depending on the research interests of the instructor, courses under this rubric explore topics in the study of literature that do not fall neatly under the rubrics above. In the past the course has dealt with literature and aging, and with issues in the field of popular culture.

Environmental Biology

ENVB*6040 Molecular Basis of Plant-Microbe Interactions F [0.50]

A lecture and seminar course on recent advances in the study of plant-microbe interactions. Topics included are the biochemical, physiological and genetic aspects of plant defenses and the interaction of plants with pathogenic and mutualistic bacteria, fungi and viruses. Offered in conjunction with PBIO*4000. Extra work is required of graduate students.

Restriction(s): Credit may be obtained for only one of ENVB*6040 or PBIO*4000

ENVB*6190 Environmental Microbial Technology W [0.50]

Current topics in selected areas of environmental microbial technology. An emphasis will be placed on the physiology and genetics of microorganisms useful in environmental biotechnology. The course involves extensive use of current journal articles. (Offered in alternate odd years.)

Restriction(s): Undergraduate degree in microbiology or related discipline.

ENVB*6340 Colloquium in Insect Systematics W [0.25]

Weekly discussions and seminars dealing with current topics in systematic entomology. (Offered in alternate odd years according to demand)

ENVB*6451 Topics in Environmental Biology F,W,S [0.25]

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in the major areas of departmental specialization such as plant protection, entomology, and environmental management. This course may be offered in any of lecture, reading/seminar, or individual project formats.

ENVB*6452 Topics in Environmental Biology F,W,S [0.50]

See ENVB*6451

ENVB*6520 Pollination Biology F [0.50]

Pollination biology is discussed from both entomological and botanical viewpoints, stressing fundamental and applied aspects. (Offered in the Fall semester or by arrangement with the professor.)

ENVB*6530 Toxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for toxicological risk characterization. The course material will cover the topics: problem definition, concentration-response characterization, exposure characterization, and risk assessment and risk-management decision making. Department of Environmental Biology

Restriction(s): Credit may be obtained for only one of TOX*6530, ENVB*6530, ENVB*4550 and TOX*4550

ENVB*6540 Integrated Pest Management - Insects W [0.50]

Concepts associated with integrated pest management of insect pests of various plant hosts will be introduced to students in an interactive lecture and laboratory format. Experiential learning and skill development, associated with economic entomology, will also be emphasized. (Offered in alternate even years.)

Restriction(s): Credit may be obtained for only one of ENVB*6540 and ENVB*4100

ENVB*6550 Bioactivity and Metabolism of Pesticides W [0.50]

The basis of pesticide bioactivity will be examined, with emphasis on mode of action, structure-activity relationships and analytical methods. Students will participate in seminars and prepare a research paper and/or conduct a laboratory research project in consultation with the instructor(s). Students in this course are expected to attend the lectures for ENVB*4240.

ENVB*6560 Forest Ecosystem Dynamics F [0.50]

An exploration of energy flow and distribution in forest ecosystems. Both components will be examined in the context of biomass and productivity, perturbations and resilience. Some aspects of modelling will be covered.

ENVB*6710 Seminar F-W [0.25]

This course provides information and training in scientific presentations. Students will prepare a written essay based on their research and make an oral presentation of their proposed studies. Students are expected to take this course in the second or third semester of their study.

European Studies

EURO*6000 Research Methods F [0.50]

This course will: a) introduce students to the field and research methods of European Studies, b) familiarize them with field-relevant research skills and methodologies.

EURO*6010 European Identities W [0.50]

This core course examines historical and contemporary ideas of the 'nation' and of 'Europe' and their relationships to identity, from an interdisciplinary perspective. Using core concepts that span various disciplines, the course investigates the construction and implications of national, minority, European and EU identities.

EURO*6020 Myth, Fairy Tales and European Identities W [0.50]

An exploration of how myths and fairy tales have been refashioned in European literature, music and art to express political, social or psychological concerns. Examples will be chosen from different national cultures and epochs. Content will vary according to the interersts of the instructor(s).

EURO*6030 Women and the Arts in Europe: Seeking Expression F [0.50]

This course examines women's participation in the arts in Europe. Content will vary according to the interests of the instructor(s). Possible approaches: an examination of women's relationships to European cultural institutions, or the extent of women's participation in central pan-European artistic movements.

EURO*6040 Europe and the Discourse of Civilization U [0.50]

This course explores the genealogy of the idea of 'civilization' with respect to Europe as it emerges from the writings of medieval, renaissance, early modern and modern art historians, and its role in contemporary political discourse. Literature and music may also be included.

EURO*6050 European Integration and the EU F [0.50]

This course examines the contributions of international relations, comparative politics and/or governance/public policy to the study of European integration and the EU. Students will learn about the major concepts and theories of these sub-disciplines of political science to analyze the development, institutions, policy processes, policies and politics of the EU.

EURO*6070 Topics in Comparative European Culture I U [0.50]

An examination of a topic, period, or region in any aspect of European culture. The content of the course will vary according to the topic and the professor teaching the course at any given time. It will also differ from the content of Topics in Comparative European Culture II.

EURO*6072 Topics in Comparative European Culture II U [0.50]

An examination of a topic, period, or region in any aspect of European culture. The content of the course will vary according to the topic and the professor teaching the course at any given time. It will also differ from the content of Topics in Comparative European Culture I.

EURO*6080 Directed Reading Course F,W,S [0.50]

An independent reading project carried out by the student under the supervision of a European Studies graduate faculty member.

EURO*6100 Research Project U [1.00]

This research project will result in a major paper of about 12,000 words. The student chooses a topic with the guidance of a faculty member. The topic must be approved by the Graduate Commitee.

Family Relations and Applied Nutrition

FRAN*6000 Research Methods F [0.50]

This course includes critical appraisal of the research literature. Research ethics, subject selection, measurement issues, survey design, experimental and quasi-experimental designs, cross-sectional and longitudinal designs, scale development, questionnaire development and sampling strategies are discussed.

FRAN*6010 Applied Statistics F [0.50]

Students will learn conceptual and practical applications of statistical analyses with emphasis on hypothesis formation, data screening, test selection, inferential statistics, univariate and multivariate analysis of variance/covariance (including repeated measures designs), simple and multiple regression, logistic regression, regression diagnostics, model building and path analytic techniques.

Co-requisite(s): FRAN*6000
Restriction(s): Instructor consent required for non-FRAN students

FRAN*6020 Qualitative Methods W [0.50]

This course teaches students how to use qualitative methods as a mode of inquiry for understanding issues in human development, nutrition and family relationships. The emphasis is on project design, data collection techniques, analysis strategies and procedures for final write-up.

FRAN*6070 Sexual Issues and Clinical Interventions Across the Life Span S [0.50]

This course examines sexual issues and clinical interventions from a life span perspective. Focusing upon theory, research and clinical interventions it explores the relationship between issues in sexual development and sexual functioning. This course is offered in a one-week intensive format in coordination with the Guelph Sexuality Conference.

Restriction(s): Signature required.

FRAN*6080 Special Topics in Couple and Family Therapy U [0.50]

This graduate seminar will feature research and practice issues in selected areas pertinent to the field of Couple and Family Therapy. Selected topics may vary from offering to offering.

FRAN*6090 Practicum in Couple and Family Therapy* U [0.50]

This course features supervised clinical practice in couple and family therapy. It involves regular clinical work with couples, families, and individuals. Students meet with faculty each week for up to six hours of supervision. Supervision over the semester will involve both group and individual/dyadic meetings.

Restriction(s): Available only to students in the Couple and Family Therapy program

FRAN*6095 Externship in Couple and Family Therapy S [0.50]

This is an advanced clinical practicum in Couple and Family Therapy. Students are placed in a community agency where they accumulate 10-15 hours per week (over 3 days) of direct clinical contact time. All clinical work is supervised by a clinical supervisor on site. Travel to the community agency is usually required.

Prerequisite(s): FRAN*6090
Restriction(s): Available only to students in the Couple and Family Therapy field of study

FRAN*6100 Clinical Issues in Couple and Family Therapy* U [0.50]

This course is taken four times in the two year program of study. Each offering features selected clinical issues; examination of each issue will include the socio-cultural context, theoretical location, and conceptual and practical implications for couple and family therapy.

Restriction(s): Available only to students in the Couple and Family Therapy field of study

FRAN*6120 Theories and Methods of Family Therapy I W [0.50]

This course will offer an historical perspective on the development of the field of couple and family therapy beginning with family systems therapy, through intergenerational models, to current constructionist approaches. Intervention methods consistent with these conceptual frameworks are examined. (Offered in alternate years.)

FRAN*6130 Theories and Methods of Family Therapy II F [0.50]

This course explores clinical theory and methods associated with structural, strategic and solution focused models of couple and family therapy. Feminist perspectives and approaches are used to examine power and gender dynamics in therapy. (Offered in alternate years.)

FRAN*6140 Professional Issues U [0.50]

An exploration of ethics in couple and family therapy; legal issues in the practice of family therapy; and professional issues regarding identity, licensure and practice.

FRAN*6160 Introduction to Systemic Practice in Couple and Family Therapy F [0.50]

An exploration of family process to understand diversity in family structures and functioning from a systemic conceptual framework. Applied activities in the associated tutorial section focus on developing basic communication, observational, and therapy skills. Student participation in small learning groups supports skill development and integration of theory and practice.

Restriction(s): Available only to students in the Couple and Family Therapy field of study

FRAN*6180 Research Issues in Couple and Family Therapy F [0.50]

The focus of this course is on research in Couple & Family Therapy, including issues related to evidence-based practice, therapeutic outcome, and therapeutic process. A selected review of quantitative and qualitative research methods and exemplary research is included. (Offered in alternate years.)

Restriction(s): Available to FRAN graduate students only.

FRAN*6200 Research Topics in Family Relations and Human Development U [0.50]

Contemporary research in family relations and human development. Research topics vary.

Restriction(s): Instructor consent required for non-FRAN graduate students.

FRAN*6210 Program Evaluation U [0.50]

An examination of the theoretical principles and practical applications of evaluation issues and strategies. Special attention is given to services for children and families across the life span. (Offered in alternate years.)

FRAN*6221 Evidence-Based Practice and Knowledge Translation U [0.50]

The principles of evidence-based practice are examined using various examples of psychosocial, behavioural and health interventions. The levels of evidence, criteria for efficacy and effectiveness, and the importance and limitations of evidence-based practice will be evaluated. The process of moving knowledge derived from high quality evidence into practice will be appraised throughout the course. Students will have the opportunity to build knowledge in their own areas of interest. (Offered in alternate years.)

FRAN*6260 Practicum in Family Relations and Human Development U [0.50]

Supervised practicum experience in a variety of agencies or services. Placements are arranged on an individual basis subject to the requirements of students' programs of study and must be negotiated with faculty in advance of registration.

Restriction(s): Available to FRAN graduate students only.

FRAN*6270 Issues in Family-Related Social Policy U [0.50]

This course investigates definitions of social policy, comparative family-related social policy, selected issues in Canadian family policy and frameworks for analysis of social policy. Issues in policy-related research are also explored. (Offered in alternate years.)

FRAN*6280 Theorizing in Family Relations and Human Development U [0.50]

An examination of the meaning of science and theory in relation to the study of families and human development. Included is a discussion of the major social science paradigms including positivism, critical theory, social constructionism and post-modernity. This course is designed for doctoral students. (Offered in alternate years.)

FRAN*6310 Family Relationships Across the Life Span U [0.50]

Considers theory and research on family and social relationships across the life span. Examples may include: parent-child, sibling, grandparent, couples, etc. (Offered in alternate years.)

FRAN*6320 Human Sexuality Across the Life Span U [0.50]

This course covers research, theoretical and substantive issues relevant to studying human sexuality across the life span. Topics include: child and adolescent sexuality, sexual identity, sexuality in adulthood and old age, sexual assault, international research and sex education. (Offered in alternate years.)

FRAN*6330 Research Seminar U [0.25]

Research literature in Family Relations and Human Development. Registration for this course occurs in semester 5 for MSc students and semester 7 for PhD students. Thesis students attend weekly seminars in each of the Fall and Winter semesters of their program of study.

Restriction(s): Available to FRAN graduate students only.

FRAN*6340 Interdisciplinary Perspectives in Family Relations and Human Development W [0.50]

This course acquaints students with the diverse disciplinary perspectives used in the study of family relations and human development. Substantive research issues provide a forum for integrating the separate perspectives and understanding the reciprocal relationship between individual and family growth and development.

FRAN*6350 Major Research Paper U [1.00]

The major research paper is an option open **only** to MSc students within the Couple and Family Therapy area. Students must demonstrate their ability to accurately synthesize and critically evaluate the literature in a specific area of interest. Detailed guidelines are provided.

Restriction(s): Available only to students in the Couple and Family Therapy field of study.

FRAN*6370 Social Development During Childhood and Adolescence U [0.50]

A detailed study of factors important to social development and competence from infancy through adolescence. (Offered in alternate years.)

FRAN*6410 Developmental Assessment and Intervention in Childhood and Adolescence U [0.50]

An examination of psychological difficulties encountered in childhood and adolescence. Special attention will be given to theoretical models used to explain childhood difficulties, categorization systems, assessment techniques, methods of intervention, as well as ethical issues specific to working with children and adolescence. (Offered in alternate years.)

FRAN*6440 Applied Factor Analysis & Structural Equation Modelling U [0.50]

This course introduces students to exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. Topics include: model selection and validation, multiple group models, measurement equivalence/invariance and latent mean analyses. This course is data-driven and students will learn through hands-on analytic experiences accompanied by in-class lectures and readings. (Offered in alternate years)

Prerequisite(s): FRAN*6000, FRAN*6010
Restriction(s): Instructor consent required for non-FRAN students

FRAN*6510 Nutrition in the Community W [0.50]

Concepts and knowledge of nutrition as applied in community and public health nutrition. Examination of current programs in applied nutrition.

Restriction(s): Instructor consent required for non-FRAN students.

FRAN*6550 Research Seminar U [0.25]

Research literature in applied nutrition. Registration for this course occurs in semester 5 for MSc students and semester 7 for PhD students. Students attend weekly seminars in each of the Fall and Winter semesters of their program of study.

FRAN*6560 Special Topics in Applied Human Nutrition U [0.50]

FRAN*6610 Advances in Clinical Nutrition/Assessment I F [0.50]

An advanced overview of nutritional assessment and clinical nutrition with emphasis on issues relevant to community based and non-acute care settings. Nutrition assessment methods will be discussed in depth along with emerging issues. Emphasis on clinical nutrition will be integration of theory and practice.

Restriction(s): Instructor consent required for non-FRAN students

FRAN*6620 Nutritional Epidemiology W [0.50]

An investigation of selected non-communicable diseases. The emphasis is on epidemiologic methods and identification of nutritional risk factors. (Offered in alternate years.)

FRAN*6710 Practicum in Applied Human Nutrition I F [1.50]

This course provides a practicum of 3 days per week with a dietetic-related agency or organization to develop and perform dietetic competencies (internship experience). In weekly seminars, students discuss and reflect on theory and dietetic practice issues.

Restriction(s): For MAN students only.

FRAN*6720 Practicum in Applied Human Nutrition II W [1.50]

This course provides a practicum of 3 days per week with a dietetic-related agency or organization to develop and perform dietetic competencies (internship experience). In weekly seminars, students discuss and reflect on theory and dietetic practice issues

Prerequisite(s): FRAN*6710
Restriction(s): For MAN students only.

FRAN*6730 Practicum in Applied Human Nutrition III S [1.50]

This course provides a practicum of 3 days per week with a dietetic-related agency or organization to develop and perform dietetic competencies (internship experience). In weekly seminars, students discuss and reflect on theory and dietetic practice issues.

Prerequisite(s): FRAN*6720
Restriction(s): For MAN students only.

FRAN*6740 Foodservice Management in Healthcare W [0.50]

Students will critically assess and integrate foodservice management literature and theories to address the multifactorial issues in foodservice operations in healthcare. Case studies presented by expert guests and operational projects will support student synthesis and evaluation of the literature.

Restriction(s): Instructor consent required for non-FRAN students.

FRAN*6750 Final Project in Applied Human Nutrition S [0.50]

This project (usually related to an activity during the Practicum in Applied Human Nutrition) consists of a written report of an applied research project in dietetic practice or a proposal for a research project, including literature review, purpose, methodology, and analysis plan.

Restriction(s): For MAN students only.

Food, Agricultural and Resource Economics

FARE*6100 The Methodologies of Economics W [0.50]

Alternative views on the methodology of economics are reviewed and assessed. The process of problem identification in the development of a research project proposal is investigated.

FARE*6140 Major Paper in Food, Agricultural and Resource Economics U [1.00]

The major paper is an option only available to MSc students registered in the course-based option master program. An original research project related to the specialization of choice in food, agricultural and resource economics will be undertaken. The project will include preparation of a written paper and an oral presentation of the findings to the faculty.

Restriction(s): Restricted to students in the course-based MSc program in FARE

FARE*6380 Applied Microeconomics for Agricultural Economists F [0.50]

The objective of this course is to foster a deeper understanding of standard microeconomic concepts and their appliction to a wide variety of topics in food, agricultural, and resource economics. Emphasis is placed on what tool(s) to use in a wide variety of circumstances to address real life problems. Topics will include decisions by firms and consumers, market equilibrium, and production decisions.

Prerequisite(s): ECON*2770 or equivalent, ECON*2310 or equivalent, ECON*3740 or equivalent

FARE*6400 Advanced Topics in Agricultural Economics S [0.50]

The application of economic theory and various contemporary tools of economic analysis in solving production problems in the agricultural sector of the economy.

FARE*6600 Agriculture in Economic Development F [0.50]

The course is concerned with the role of agriculture as a source of food, fibre and employment in developing countries. The interaction between agriculture and other sectors of the economy and other countries is also examined.

Prerequisite(s): ECON*1050 or equivalent, ECON*1100 or equivalent

FARE*6720 Readings in Agricultural Economics F,S,W [0.50]

A reading course on selected topics of special interest. May be offered to individual students or to groups of students in any semester.

FARE*6800 Seminar in Agricultural Economics U [0.00]

Students in the MSc program must give two presentations at the annual MSc research symposium; one in their first year outlining their research plan, and one in their second year on their thesis research results.

FARE*6910 Applied Policy Analysis I W [0.50]

An overview of domestic and international agrifood policies and an introduction to the concepts and methods used to evaluate domestic trade policies.

Prerequisite(s): FARE*6380

FARE*6920 Applied Policy Analysis II U [0.50]

A presentation and evaluation of advanced quantitative agrifood policy models and selected special topics related to domestic and trade policy evaluation.

Prerequisite(s): AGEC*6910 or FARE*6910 or equivalent
Co-requisite(s): ECON*3710

FARE*6930 Food Firms, Consumers and Market I F [0.50]

This course examines the application of microeconomic theory to food markets. Topics covered include: optimizing behaviour by economic agents, the certainty equivalent profit model and decision making under risk, optimal capital replacement models and their application to food system economics, consumer behaviour with respect to food products and behaviour with respect to food products and behaviour of marketing intermediaries and food processors. New developments in the economic theory of the form are surveyed. (Offered in alternate years.)

Prerequisite(s): ECON*2310 or equivalent, ECON*3740 or equivalent

FARE*6940 Food Firms, Consumers and Markets II U [0.50]

This course builds on Food Firms, Consumers and Markets I by extending the breadth and depth of student's understanding and scope of economic analysis. Advanced techniques in producer and consumer theory, as well as advance market analysis techniques are presented and utilized. Understanding of the research process and advanced methods is emphasized throughout.

Prerequisite(s): AGEC*6930 or FARE*6930

FARE*6950 Natural Resource Economics I W [0.50]

Natural Resources I introduces conventional theoretical modeling approaches to renewable resources, e.g. fisheries & forestry. Seminal theoretical literature is discussed. Emphasis is placed on setting up economic models, deriving and interpreting general results. Applied methods include dynamic optimization and regression analysis. Additional topics include Land Economics and the property rights approach.

Prerequisite(s): FARE*6380

FARE*6960 Natural Resource Economics II U [0.50]

Natural Resources II reviews & extends conventional theoretical modeling approaches to renewable resources, e.g. fisheries & forestry. Seminal literature is reviewed and contemp. theoretical work and empirical papers discussed. Emphasis on extending economic models addressing natural resource issues - uncertainty, externalities & policy instruments, and derive reduced-form versions of forestry & fishery for empirical estim. & analysis. Primary method of math analysis involves dyn. opt. techniques. Detailed math derivations & proofs expected. Also- extinction, climate change, carb sequest.

Prerequisite(s): AGEC*6950 or FARE*6950

FARE*6970 Applied Quantitative Methods for Agricultural Economists F [0.50]

This course exposes students to the empirical tools agricultural economists use when conducting research. Emphasis is placed on what tool(s) to use in a variety of circumstances. Topics covered will include advanced econometric techniques, optimization and simulation modelling. Students will also be exposed to the different quantitative software packages used in empirical research.

Prerequisite(s): ECON*3740 or equivalent and ECON*2770 or equivalent

FARE*6980 Agricultural Trade Relations W [0.50]

An examination of the institutional, theoretical and empirical aspects of international agrifood trade.

Prerequisite(s): FARE*6380, one of AGEC*6910 or FARE*6910

Food Safety and Quality Assurance

FSQA*6000 Food Safety and Quality Assurance Seminar U [0.50]

Provides experiential training in forms of communication that are likely to be required in professional or academic careers in food science and technology.

Restriction(s): Credit many only be obtained for one of FSQA*6000 or FOOD*6300.

FSQA*6100 Food Law and Policy F [0.50]

The fundamentals of food policy development and Canadian and international food law are learned and practiced through online presentations, independent study and online interactions with other students and industry professionals.

Restriction(s): Offered by distance education only.

FSQA*6150 Food Quality Assurance Management W [0.50]

Examination and review of principles and concept of quality assurance and their application to consumer products and services. Topics include applied aspects of total-quality management principles.

Restriction(s): Offered by distance education only.

FSQA*6200 Food Safety Systems Management W [0.50]

Food safety systems are studied in four modules. (1) A brief review of plant hygiene and HACCP principles. Students with insufficient background will do supplemental study in these areas; (2) HACCP implementation and verification; (3) HACCP-based food safety programs in Canada; and (4) International Food Safety Management Systems.

Restriction(s): Offered by distance education only.

FSQA*6500 Food Safety and Quality Assurance Research Project S,F,W [1.00]

An original research project related to food safety and quality assurance which includes the preparation of a written report suitable for publication and an oral presentation of the findings to the graduate faculty.

FSQA*6600 Principles of Food Safety and Quality Assurance S [0.50]

An integrated approach to factors affecting food safety and quality including microbial and chemical contamination is provided. Major food-borne disease outbreaks are studied as examples. Modern methods of quality management to minimize contamination of processed foods is discussed.

Restriction(s): Offered by distance education only.

Food Science

FOOD*6110 Food Materials Science U [0.50]

Mechanical properties of foods. Application of the principles of rheology to food materials. Relationship between texture and microstructure. Instrumental measurement of food texture. Principles of measurement systems for different types of foods. Interpretation of force-deformation diagrams. Texture modification. Texture profile analysis.

FOOD*6120 Fruit and Vegetable Technology F [0.50]

A course that deals with the current status of technologies based on fruits and vegetables. The subject coverage will include post harvest storage, the parameters that determine quality, biochemical and molecular strategies for improving storage life and quality, processing technologies and issues related to genetic engineering, food safety, functional food ingredients and their health-regulatory function.

FOOD*6160 Chemistry of Food Lipids U [0.50]

Composition and function of lipids in food systems. Analytical procedures used in isolating, identifying and quantifying lipid components. Lipid classes and their properties. Polyunsaturated lipids and their reactions. Physical properties of lipids and instrumental methods of analysis. Industrial processing including hydrogenation, fractionation, interesterification and enzymic processes. Biotechnology of lipids.

FOOD*6170 Chemistry of Food Proteins U [0.50]

This course deals with theoretical and practical approaches to food proteins including their analysis. The following topics will be covered: physiochemical properties of proteins/amino acids, quantification of protein/amino acids, protein structure analysis, protein denaturation, chemical modification/genetic engineering and structure-functional properties of food proteins. In addition, food protein systems such as muscle, eggs, milk and vegetable proteins will be discussed.

FOOD*6190 Advances in Food Science U [0.50]

Topics of current research interest and importance are examined. A project supervised by a faculty member is undertaken, the topic of which is chosen after considering the interests of the student.

FOOD*6210 Chemistry of Food Carbohydrates U [0.50]

This course is designed to familiarize students with the principles of carbohydrate chemistry. It focuses on the structural and functional characteristics of food carbohydrates - both sugars and polysaccharides - their analysis and applications in various food systems.

FOOD*6220 Advanced Food Analysis Methodology U [0.50]

Theory and practical applications of modern analytical techniques. Topics covered include differential scanning calorimetry, spectroscopy, gas liquid chromatography, high performance liquid chromatography and microscopy as well as various spectroscopic techniques (e.g. UV, fluorometry, circular dichroism).

FOOD*6260 Food Colloids U [0.50]

Principles of colloid science as applied to foods that contain small particles, e.g., emulsions, foams. Methods for studying colloidal particles in food materials. Manufacture, structure, properties and stability of food colloids, e.g.,oil-in-water emulsions, water-in-oil emulsions, milk and dairy products. Use of food emulsifiers.

FOOD*6280 Rapid Methods in Food Microbiology U [0.50]

The course is designed to update knowledge of modern methods for the microbiological analysis of foods. Theory and practical applications are discussed. Methods reviewed include bioluminescence, impediometry, immunological techniques, gene probes and other emerging technologies.

FOOD*6300 Food Science Communication S [0.50]

This course provides experiential training in forms of communication that are likely to be required in professional or academic careers in food science and technology.

Restriction(s): Credit many only be obtained for one of FOOD*6300 or FSQA*6000.

FOOD*6350 Applied Functional Foods and Nutraceuticals W [1.00]

This course prepares students to develop an innovative product or service from conceptualization to market entry considering regulatory, product development, safety/efficacy and market readiness issues. Offered jointly with HHNS*6410

Prerequisite(s): HHNS*6400

FOOD*6600 Advanced Food Microbiology U [0.50]

This course will review current issues in food microbiology. Topics to be covered will include the microbial ecology of food, factors affecting the growth and survival of microorganisms in foods, and strategies for the production of safe food.

FOOD*6620 Industrial Microbiology U [0.50]

Applications of Molecular Genetics and Biotechnology to industrial microbial processes including the production of organic acids, amino acids, antibiotics, ethanol, and solvents. There is extensive coverage of the fermentation industries: baking, brewing, vinting and spirit production.

French

FREN*6000 Research Methods Seminar F [0.50]

This course will introduce students to the field and research methods of various disciplines and of interdisciplinary studies, and it will familiarize them with field-relevant research skills and methodologies.

FREN*6020 Topics in French Literature U [0.50]

This course will focus on European French literature in relation to thematic approaches including: gender and feminism, transgression, (post)colonialisms, identity and alterity.

FREN*6021 Topics in Quebec and French-Canadian Literatures W [0.50]

This course will focus on how literature functions as a socio-political institution in Quebec and in French Canada. It will also deal with elements that relate more broadly to identity, reception theory and semiotics.

FREN*6022 Topics in Caribbean and African Literatures F [0.50]

This course focuses on the works of major Francophone African and Caribbean fictional and theoretical works with particular attention being given to links between notions of cultural hierarchies, identity, métissage and creolization.

FREN*6030 Topics in Translation U [0.50]

This course deals with various aspects of literary translation, including theories of translation, the role of reading in translation, the active translation of a text from English into French, and the reflection upon the influence of each of these categories on the others.

FREN*6031 Topics in Intermediality U [0.50]

An investigation of the intersection of artistic expression taking place in literature, theatre, film, television and new media and the various effects produced by the interaction of two or more media.

FREN*6041 Topics in French and French-Canadian Sociolinguistics W [0.50]

This course will allow students to explore, within the framework of sociolinguistics and applied linguistics, the relationship between language and society, with particular reference to French and the French-speaking world.

FREN*6042 Topics in FSL Pedagogy U [0.50]

This compulsory course covers theories, methods, and real-life applications of the teaching/learning of a second language, specifically French.

FREN*6050 Reading Course S [0.50]

An independent study course, the nature and content of which is agreed upon between the student and the professor offering the course. Subject to the approval of the graduate coordinator.

FREN*6051 Major Research Paper U [0.50]

This independent, required course allows students to pursue research in an area of particular interest to them in the field of French Studies. A compulsory major paper 40 pages in length will be required.

Prerequisite(s): FREN*6000

FREN*6053 Practicum in French Studies S [0.50]

This course will allow students to engage in volunteer service in a francophone community. Students will be asked to forge links between knowledge acquired in the academic setting and problem-based learning in a real-world context. A list of authorized community partners will be provided.

Prerequisite(s): FREN*6000 and FREN*6042

Geography

GEOG*6060 Special Topics in Geography S,F,W [0.50]

A course on some specific topic not covered by the regular graduate courses for which there are both available faculty and sufficient interest among students.

Restriction(s): Instructor's signature required

GEOG*6090 Geographical Research Methods I F [0.50]

A review of philosophies and research methods in geography. The development and presentation of a context paper for the thesis or research project.

GEOG*6091 Geographical Research Methods II W [0.50]

A review of philosophies and research methods in geography. The development and presentation of a research proposal for the thesis or research project.

Prerequisite(s): GEOG*6090

GEOG*6100 Geographic Scholarship and Research F-W [0.50]

A review of geographic scholarship including conceptual, theoretical and methodological issues in resource assessment, biophysical resources and rural socio-economic resources. The course extends over two semesters (Fall and Winter).

GEOG*6180 Research Project in Geography S,F,W [1.00]

The preparation and presentation of a report on the research project approved in GEOG*6090.

Restriction(s): Instructor's signature required

GEOG*6281 Environmental Management and Governance F [0.50]

Analysis, evaluation and management of environmental resources. Emphasis is on biophysical and socio-economic concepts and methods which offer a more comprehensive and integrative basis for environmental decisions.

GEOG*6330 Biotic Processes and Biophysical Systems U [0.50]

Investigation of biotic processes influencing the composition, structure and distribution of plant and animal communities and of approaches to biophysical systems analysis, focusing on environmental system interaction at the landscape scale.

GEOG*6340 Human-Environment Relations W [0.50]

A critical review of philosophies, concepts and analytical methods for analysis and management of systems involving the interaction of environmental processes and human spatial activity.

GEOG*6400 Urbanization and Development U [0.50]

Analysis of the evolution of urban form and pattern in the developing world within the context of the global urban system. Examines national urban systems and implications for dispersed development and rural change. (alternate years)

GEOG*6450 Development Geography U [0.50]

Group identities at various scales in relation to concepts of territory and territoriality, and their changing impact on the world's political map. (alternate years)

GEOG*6550 Environmental Modelling W [0.50]

This course aims to provide students with an understanding of the processes and techniques involved in environmental modeling practice and will focus on the power and limitations of existing models.

GEOG*6610 Global Hydrology F [0.50]

An examination of global environmental hydrology including precipitation, evaporation, subsurface water and runoff. Physical processes, measurement, analytical techniques and modelling strategies will be considered in the context of global change.

History

HIST*6000 Historiography I F [0.50]

This course will introduce students to some of the essential components of the historical process as exemplified by the literature produced prior to 1914. It will also assess history as a cognitive discipline in contemporary society. While the scope of the course will extend from ancient times to the eve of World War I, emphasis will be placed on 19th-century historiography.

HIST*6020 Historiography II W [0.50]

An examination of major examples of recent historical methodology, including works in cultural and social history. The student is also expected to develop and present a thesis proposal.

HIST*6040 Special Reading Course U [0.50]

Students selecting this course should speak to individual instructors to arrive at appropriate topics.

HIST*6140 Topics in British History Since 1688 U [0.50]

Although topics vary with the expertise of individual instructors, this course encompasses the British Isles.

HIST*6141 British History Research U [0.50]

Continuation of HIST*6140 in which students prepare an indepth research paper based on primary sources.

HIST*6150 Scottish Archival Research U [0.50]

This course wil comprise of classroom teaching, practical instruction and work-placement within the Scottish Collection of the University of Guelph's Archives. It will introduce students to basic skills in the digitization of sources and teach competence in conservation, record creation and archival research.

Restriction(s): Student numbers are limited by the number of placements available in the University Archives.

HIST*6190 Topics in Scottish History I U [0.50]

This course will introduce students to selected aspects of medieval and early modern Scottish history and historiography, including the use of source materials, and practical training involving manuscripts in the University Archives.

HIST*6191 Scottish History I Research U [0.50]

Continuation of HIST*6190 in which students prepare an indepth research paper based on primary sources.

HIST*6200 Topics in Scottish History II U [0.50]

This course will introduce students to selected aspects of modern Scottish history and historiography, including the use of source materials, and provide practical training involving manuscripts in the University Archives.

HIST*6201 Scottish History II Research U [0.50]

Continuation of HIST*6200 in which students prepare an indepth research paper based on primary sources.

HIST*6230 Canada: Culture and Society U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

HIST*6231 Canada: Culture and Society Research U [0.50]

Continuation of HIST*6230 in which students prepare an indepth research paper based on primary sources.

HIST*6280 Canada: Community and Identity U [0.50]

A course that examines the current historiography of selected aspects of Canadian history. Topics will vary with the expertise of individual instructors.

HIST*6281 Canada: Community and Identity Research U [0.50]

Continuation of HIST*6280 in which students prepare an indepth research paper based on primary sources.

HIST*6290 Topics in North American History U [0.50]

Depending on the expertise of the instructor, this course may concentrate on either the United States or Canada, or it may select an historical theme or themes common to the larger continent.

HIST*6291 North American Research U [0.50]

Continuation of HIST*6290 in which students prepare an indepth research paper based on primary sources.

HIST*6300 Topics in Modern Europe I U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

HIST*6301 Modern Europe I Research U [0.50]

Continuation of HIST*6300 in which students prepare an indepth research paper based on primary sources.

HIST*6310 Topics in Modern Europe II U [0.50]

This seminar course will focus on selected aspects of the political and social history of Europe between 1789 and 1989. Topics to be examined will vary according to the expertise of the faculty and the interest of the students.

HIST*6311 Modern Europe II Research U [0.50]

Continuation of HIST*6310 in which students prepare an indepth research paper based on primary sources.

HIST*6350 History of the Family U [0.50]

This course will cover a broad range of historical developments within the family, all concentrating on the interaction between the family (or elements within it) and outside authority (both formal and informal).

HIST*6351 Family History Research U [0.50]

Continuation of HIST*6350 in which students prepare an indepth research paper based on primary sources.

HIST*6360 History of Sexuality and Gender U [0.50]

This course will provide a thematic approach to the foundations of Western attitudes towards sexuality and gender, especially as they developed in premodern Europe. The complex interweaving of medicine, Christian law and theology, and popular practices and beliefs will be explored.

HIST*6361 Sexuality History Research U [0.50]

Continuation of HIST*6360 in which students prepare an indepth research paper based on primary sources.

HIST*6370 Topics in Cultural History U [0.50]

History 6370 investigates the practices of cultural history and the utility of the cultural history paradigm in the investigation of topics including politics and power, religion, war, empire, gender, class, 'race', ethnicity, the environment, and consumption.

HIST*6371 Cultural History Research U [0.50]

Continuation of HIST*6370 in which students prepare an indepth research paper based on primary sources.

HIST*6380 Topics in Early Modern European History U [0.50]

This seminar course examines current issues in early modern European history as selected by instructor(s). Participants review current research and historiography, discuss the principal debates, and develop their own perspectives through encounter with primary source materials.

HIST*6381 Early European Research U [0.50]

Continuation of HIST*6380 in which students prepare an indepth research paper based on primary sources.

HIST*6400 Major Paper U [1.00]

This is to be a major piece of research, based on the extensive use of primary sources. An oral examination of this work is required.

HIST*6450 Quantitative Evidence and Historical Methods U [0.50]

An overview of the use for historical research of quantitative evidence and methodologies.

HIST*6500 Topics in Global History U [0.50]

This is a topical course, that explores the history of processes that take place on a worldwide scale. These may include social, cultural, economic, or environmental processes.

HIST*6501 Global History Research U [0.50]

Continuation of HIST*6500 in which students prepare an indepth research paper based on primary sources.

HIST*6520 Topics in Latin American History U [0.50]

In-depth study of a particular event or process in Latin American history. Topics may include: religions, women, race and ethnicity, environment issues, intellectual history, or have a regional or temporal focus.

HIST*6521 Latin American Research U [0.50]

Continuation of HIST*6520 in which students prepare an indepth research paper based on primary sources.

HIST*6540 Topics in South Asian History U [0.50]

Topics in South Asian History will examine the history and historiography of imperialism and nationalism in India from 1757 to 1947.

HIST*6541 South Asian History Research U [0.50]

Continuation of HIST*6540 in which students prepare an indepth research paper based on primary sources.

HIST*7000 Professional Development Seminar U [0.00]

All doctoral students attend the professional development seminar in their first year of the program. The seminar is designed to prepare students for success as a PhD student for their future careers.

HIST*7010 Qualifying Examination U [0.50]

This oral examination is designed to assess 1) the student's knowledge of the subject matter and ability to integrate the material read and 2) the student's ability and promise in research.

HIST*7030 Language Requirement U [0.00]

A written demonstration of the student's knowledge of written French (or other appropriate second language).

HIST*7040 Major Field U [0.50]

The examination written following completion of the major field seminar and before the oral qualifying examination.

HIST*7070 Thesis Proposal U [0.00]

A written (up to 2,000 words, including citations) and oral demonstration of the proposed dissertation. The proposal will include a statement of the overall thesis of the dissertation, a description/discussion of the major research question(s), a review of the principal primary/archival sources being used, a chapter or topic outline, and a clear explanation of the originality of the thesis. Graded SAT/UNS.

Restriction(s): For PhD students only.

HIST*7080 Colloquium U [0.00]

The colloquium is a public presentation of original research, normally a chapter, significant portion, or summary of the student's thesis. Graded SAT/UNS.

Restriction(s): For PhD students only.

HIST*7100 Canadian History Major Seminar U [1.00]

HIST*7120 Scottish History Major Seminar U [1.00]

HIST*7140 Early Modern European History Major Seminar U [1.00]

HIST*7150 Modern European History Major Seminar U [1.00]

HIST*7170 Race, Slavery, and Imperialism Major Seminar U [1.00]

HIST*7190 War and Society Major Seminar U [1.00]

HIST*7250 Cold War Era History Major Seminar U [1.00]

Offered annually

Restriction(s): Instructor's Signature Required

HIST*7260 Medieval History Major Seminar U [1.00]

Offered annually

Restriction(s): Instructor's Signature Required

HIST*7270 World History Major Seminar U [1.00]

Offered Annually

Restriction(s): Instructor's Signature Required

HIST*7590 War and Society Minor Seminar U [1.00]

HIST*7600 Canadian History Minor Seminar U [1.00]

HIST*7610 British History Minor Seminar U [1.00]

HIST*7620 Scottish History Minor Seminar U [1.00]

HIST*7630 Community Studies Minor Seminar U [1.00]

HIST*7640 Early Modern European History Minor Seminar U [1.00]

HIST*7650 Modern European History Minor Seminar U [1.00]

HIST*7660 Gender, Women and Family Minor Seminar U [1.00]

HIST*7670 Race, Slavery, and Imperialism Minor Seminar U [1.00]

HIST*7680 United States History Minor Seminar U [1.00]

HIST*7690 International History Minor Seminar U [1.00]

HIST*7700 Science, Medicine and Technology Minor Seminar U [1.00]

HIST*7710 Other Minor Seminar U [1.00]

HIST*7750 Cold War Era History Minor Seminar U [1.00]

Offered annually

Restriction(s): Instructor's Signature Required

HIST*7760 Medieval History Minor Seminar U [1.00]

Offered annually

Restriction(s): Instructor's Signature Required

HIST*7770 World History Minor Seminar U [1.00]

Offered Annually

Restriction(s): Instructor's Signature Required

HIST*7990 Doctoral Thesis U [2.00]

Students are required to write and successfully defend a thesis of such cogency and originality as will represent a significant contribution to knowledge. The thesis will normally be between 50,000 and 90,000 words in length. Univeristy of Guelph regulations and procedures govern this process.

Hospitality and Tourism Management

HTM*6050 Management Communications F [0.50]

Examination of the theory, function and practice of managerial communications with particular emphasis on developing communication strategies and skills.

Restriction(s): CME Executive Programs students only

HTM*6110 Foundations of Leadership F [0.50]

This course will enhance students' interpersonal skills, as well as their knowledge and understanding of the theory and research underlying effective team management and collaboration on an organization. Experiential approaches are used to enhance managerial skills.

Restriction(s): CME Executive Programs students only

HTM*6120 Special Topics in Hospitality Organizational Behaviour F,W,S [0.50]

Advanced course for those specializing in organizational behaviour. Deals with in-depth analysis of industry organizational behaviour, management of current and future problems, reorganizations, corporate cultures, multi-cultural organizations, and ethics.

Restriction(s): CME Executive Programs students only

HTM*6130 Special Topics in Hospitality Organizational Behaviour F,W,S [0.50]

Advanced course for those specializing in organizational behaviour. Deals with in-depth analysis of industry organizational behaviour, management of current and future problems, reorganizations, corporate cultures, multi-cultural organizations, and ethics.

Restriction(s): CME Executive Programs students only

HTM*6140 Foundations of Human Resource Management W [0.50]

This course examines the essential human resource management functions of planning, staffing, employee development, compensation, health and safety, labour relations, and legal compliance, in a variety of organizational settings.

Restriction(s): CME Executive Programs students only

HTM*6150 Research Methods for Managers F [0.50]

Students learn to formulate a research problem, undertake a literature review, and to select and use appropriate quantitative and qualitative techniques for the collection and analysis of relevant data. The course also promotes the use of the World Wide Web as an information resource.

Restriction(s): CME Executive Programs students only

HTM*6170 Hospitality and Tourism Economics and Policy U [0.50]

The course introduces participants to economic and government policy issues that impact the hospitality and tourism industry. The course provides a strategic framework for understanding the macroeconomic and policy environment that is shaped by multilateral institutions, government and the hospitality and tourism industry.

Restriction(s): CME Executive Programs students only

HTM*6220 Special Topics in Management Issues F,W,S [0.50]

An advanced course for those specializing in management, marketing or organizational behaviour. Deals with current and future topics, trends and problems in the industry, strategic planning, and the integration of management, marketing, and organizational behaviour.

Restriction(s): CME Executive Programs students only

HTM*6300 Hospitality and Tourism Marketing F [0.50]

Analysis and application of marketing foundations through integration of marketing variables with real-world situations and in-depth analysis of strategic marketing issues.

Restriction(s): CME Executive Programs students only

HTM*6320 Special Topics in Hospitality Marketing F,W,S [0.50]

An advanced course for those specializing in marketing. Deals with marketing theories, models, and specific subsets of marketing such as pricing, consumer and industrial-buyer behaviour, distribution, services, and service-delivery concepts.

Restriction(s): CME Executive Programs students only

HTM*6330 Special Topics in Hospitality Marketing F,W,S [0.50]

An advanced course for those specializing in marketing. Deals with marketing theories, models, and specific subsets of marketing such as pricing, consumer and industrial-buyer behaviour, distribution, services, and service-delivery concepts.

Restriction(s): CME Executive Programs students only

HTM*6510 Hospitality and Tourism Revenue Management U [0.50]

This course discusses revenue maximization strategies and tactics that improve the profitability of businesses that work in fixed capacity environments, face time-varied demand, their product is homogeneous and their cost structure reflects a high proportion of fixed and a low proportion of variable cost items.

Prerequisite(s): HTM*6300
Restriction(s): CME Executive Programs students only

HTM*6530 Safety, Security and Risk Assessment in HTM U [0.50]

This course profiles legal and managerial strategies, principles and operational procedures to minimize safety and security risks faced by the hospitality and tourism industries. Risk analysis and management, crisis management, liability management, and industry specific law provide the foundation for this course.

Restriction(s): CME Executive Programs students only

HTM*6550 Managing Service Quality S [0.50]

A holistic and interdisciplinary approach is used to explore the principles of service management. The course will enhance participants' understanding of what actually constitutes quality, the nature of service, and strategies for improving it.

Restriction(s): CME Executive Programs students only

HTM*6590 Organizational Theory and Design U [0.50]

Core concepts in organizational theory and their interrelationships as well as concepts such as group decision making and intragroup and intergroup dynamics are explored.

Restriction(s): CME Executive Programs students only

HTM*6600 International Tourism and Tourism Marketing F [0.50]

Analyzes the social, political and economic impacts of tourism on the world scene, as well as the global integration of tourism in today's society.

Restriction(s): CME Executive Programs students only

HTM*6620 Special Topics in Tourism F,W,S [0.50]

Advanced course for those specializing in tourism. Deals with theories of tourism generators, multi-markets, tourism multipliers, current and future trends, regulatory environments, and distributions systems.

Restriction(s): CME Executive Programs students only

HTM*6630 Special Topics in Tourism F,W,S [0.50]

Advanced course for those specializing in tourism. Deals with theories of tourism generators, multi-markets, tourism multipliers, current and future trends, regulatory environments, and distributions systems.

Restriction(s): CME Executive Programs students only

HTM*6700 Hospitality and Tourism Strategic Management U [0.50]

An integrative course which draws together the conceptual theories and models of the graduate program core. Utilizes conceptual, analytical, problem identification, and problem solving skills.

Restriction(s): CME Executive Programs students only

HTM*6800 Operations Management U [0.50]

This course applies operations research theory and practices to management problem solving and decision-making. The focus is on modelling service and product delivery systems and major emphasis is placed on managerial problems in hospitality, tourism, and food and agribusiness organizations.

Restriction(s): CME Executive Programs students only

HTM*6900 Major Paper F,W,S [0.50]

A detailed critical review of an area of study specific to the specialization of students in the MBA by course work and major paper option.

Restriction(s): CME Executive Programs students only

Human Health and Nutritional Sciences

HHNS*6000 Students Promoting Awareness of Research Knowledge S,F,W [0.25]

This course will explore research communication through practical experience. The course will be part of the SPARK program in which students write, edit and coordinate a variety of news publications that highlight University of Guelph research activities for a wide range of audiences.

Restriction(s): Limited to HHNS MSc course work and project students only. Instructor's signature required.

HHNS*6010 Seminar in Human Health and Nutritional Sciences S [0.50]

Students will develop their scientific communication skills by translating a specific body of knowledge on a chosen topic into a seminar. The class will also explore scientific process-oriented concepts and issues such as effective scientific communication and dissemination of results.

Restriction(s): Limited to HHNS MSc course work and project students only

HHNS*6040 Research Fronts in Nutritional and Nutraceutical Sciences F [0.50]

Building on an information base in nutrition, biochemistry and physiology, the course comprises selected research topics pertaining to the importance of nutrition as a determinant of health throughout the life span. Distinction will be drawn between the metabolic basis of nutrient essentiality and the health protectant effects of nutraceuticals.

HHNS*6130 Advanced Skeletal Muscle Metabolism in Humans W [0.50]

This course examines how the energy provision pathways in human skeletal muscle and associated organs meet the energy demands of the muscle cell during a variety of metabolically demanding situations.

HHNS*6200 Research Methods in Biomechanics F [1.00]

This course covers the basic elements of biomechanics experimental data collection including instrumentation, analog-to-digital conversion, signal processing and analysis. Particular emphasis is placed on the areas of kinematics, electromyography and tissue mechanics.

HHNS*6210 Exploring Research Techniques in Biomechanics F [0.50]

This course will review basic elements of biomechanics experimental data collection including instrumentation, analog-to-digital conversion, signal processing and analysis including kinematics, electromyography and tissue mechanics. Students will also be responsible for conducting bi-weekly seminars which will analyze and critique original research investigations in the area of biomechanics instrumentation/processing techniques.

HHNS*6320 Advances in Human Health and Nutritional Sciences Research S,F,W [0.50]

This course provides the student with an opportunity to study a topic of choice and involves literature research on a chosen topic. The course may stand alone (MSc thesis and PhD students) or provide the background information for an experimental approach to the topic (MSc course work and project students).

HHNS*6400 Functional Foods and Nutraceuticals F [0.50]

This course considers the relation of nutraceuticals, functional foods, designer foods, medical foods and food additives to foods and drugs. The course emphasizes the development and commercialization of nutraceuticals.

HHNS*6410 Applied Functional Foods and Nutraceuticals W [1.00]

This course prepares students to develop an innovative product or service from conceptualization to market entry considering regulatory, product development, safety/efficacy and market readiness issues. The course applies and integrates the concepts defined in HHNS*6400

HHNS*6440 Nutrition, Gene Expression and Cell Signalling W [0.50]

This course emphasizes the role nutrients play as modulators of gene expression at the molecular level. The mechanisms by which nutrients modulate gene expression through specific cell signalling cascades are examined. (offered annually)

HHNS*6700 Nutrition, Exercise and Metabolism F [0.50]

A discussion of recent concepts in the relationships among nutrition, exercise and metabolism. Information from the molecular to the whole-body level will be presented with a focus on understanding nutrition and exercise in the human. Emphasis is placed on the development and testing of experimental hypotheses in these areas of research.

HHNS*6710 Advanced Topics in Nutrition and Exercise W [0.50]

Advanced topics will be presented to establish an in-depth understanding of current investigations in nutrition and exercise. Based on the integrated understanding of nutrition and exercise developed in HBNS*6700, the focus of this course will be to develop the student's ability to independently analyze original research investigations.

HHNS*6910 Basic Research Techniques and Processes S,F,W [0.50]

Working with a faculty advisor, students will gain experience in basic aspects of scientific research. This will be accomplished through experience of one or more components of the scientific method in a laboratory setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

Restriction(s): Restricted to HHNS MSc. course work and project students. Instructor's signature required

HHNS*6920 Applied Research Techniques and Processes S,F,W [0.50]

Under the supervision of a faculty advisor, students will gain practical experience in discipline-specific aspects of research. This will be accomplished through experience in a pre-arranged practicum in an applied setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

Restriction(s): Restricted to HHNS MSc. course work and project students. Instructor's signature required

HHNS*6930 Research Project S,F,W [0.50]

Under the supervision of a faculty advisor and building on knowledge gained from Basic or Applied Research Techniques and Processes, students will carry out a specific research project to its completion. Results will be documented in a written report and communicated through a scientific poster.

Prerequisite(s): HHNS*6910 or HHNS*6920
Restriction(s): Restricted to HHNS MSc. course work and project students. Instructor's signature required

Integrative Biology

IBIO*6000 Advances in Ecology and Behaviour U [0.50]

This is a modular course in which several faculty lecture and/or lead discussion groups in tutorials about advances in their broad areas, or related areas, of ecology and behaviour. Topics may include animal communication, optimal foraging, life-history evolution, mating systems, population dynamics, niche theory and food-web dynamics. The course includes lectures and seminars in which the students participate. Offered annually.

IBIO*6010 Advances in Physiology U [0.50]

A modular course format in which several faculty members lecture and/or lead discussion groups in tutorials on advances in their areas, or related areas, of physiology. Topics may include metabolic adaptation to extreme environments, behavioural and molecular endocrinology, and exercise and muscle physiology. The course includes lectures and seminars in which the students participate. Offered annually.

IBIO*6020 Advances in Evolutionary Biology U [0.50]

This modular course reviews books and/or other publications in the field of evolutionary biology, providing knowledge of progress in this area of biology. Topics may include epigenetics, phylogenetics, developmental basis of evolutionary change, and molecular evolution. The course includes lectures and seminars in which the students participate. Offered annually.

IBIO*6040 Special Topics in Ecology U [0.50]

Students will explore aspects of ecology not otherwise covered in existing graduate courses. A program of study will be developed with a faculty advisor according to the student's requirements. Research papers, laboratory work and/or written and oral presentations may be required.

IBIO*6060 Special Topics in Evolution U [0.50]

Students will explore aspects of evolution not otherwise covered in existing graduate courses. A program of study will be developed with a faculty advisor according to the student's requirements. Research papers, laboratory work and/or written and oral presentations may be required.

IBIO*6070 Topics in Advanced Integrative Biology I U [0.50]

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in specialized fields of integrative biology under the guidance of graduate faculty. Course topics will normally be advertised by faculty one semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats. A minimum enrolment may be required for some course offerings.

IBIO*6080 Topics in Advanced Integrative Biology II U [0.50]

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in specialized fields of integrative biology under the guidance of graduate faculty. Course topics will normally be advertised by faculty one semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats. A minimum enrolment may be required for some course offerings.

IBIO*6090 Special Topics in Physiology U [0.50]

Students will explore aspects of physiology not otherwise covered in existing graduate courses. A program of study will be developed with a faculty advisor according to the student's requirements. Research papers, laboratory work and/or written and oral presentations may be required.

IBIO*6630 Scientific Communication U [0.50]

The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal. This course is mandatory for MSc students in the Department of Integrative Biology.

International Development Studies

IDEV*6000 Regional Context U [0.50]

This reading course provides an opportunity for in-depth investigation about a particular region in preparation for a thesis, major paper or research project. The course normally is directed by the student's advisor.

IDEV*6100 International Development Studies Seminar U [0.50]

A bi-weekly seminar discussion of issues which arise in the study of international development. Led by faculty and visitors from a variety of disciplines.

IDEV*6500 Fieldwork in International Development Studies U [0.50]

This course recognizes an intensive commitment to research in an archival repository, 'in the field' or at an appropriate development institution in Canada or abroad. The course normally is directed by the student's advisor in consultation with the advisory committee

IDEV*6800 Theories and Debates in Development F [0.50]

This course examines recent approaches in development theory explaining international inequality, poverty and long-term change. It also investigates selected current debates in international development – such as food security, trade, good governance, sustainability or gender – from various discipline-based and interdisciplinary perspectives, and analyzes selected regional experiences of development.

Restriction(s): Restricted to students in doctoral IDEV programs or instructor's consent.

IDEV*6850 Development Research and Practice W [0.50]

In this course students establish the linkages between their doctoral research topic and the wider field of development studies and practice. The course will examine development policies and projects, ethical issues related to (cross-cultural) development research, and relationships between research and development practice.

Restriction(s): Restricted to students in doctoral IDEV programs or instructor's consent.

Landscape Architecture

LARC*6010 Landscape Architecture Studio I F [0.50]

Studio and field instruction introduces the student to landscape architecture through acquisition of basic professional skills and knowledge. Topics include design theory, landscape inventory and analysis, application of the design process to projects at the site scale, graphic and oral communication.

LARC*6020 Landscape Architecture Studio II F [0.50]

Studio and field instruction introduces the student to basic knowledge and skills of site engineering as it relates to landscape architecture. Topics include surveying, principles of site grading and drainage, introduction to materials and methods of construction, and graphic communication.

LARC*6030 Landscape Architecture Studio III W [0.50]

Studio and field instruction continues the student's development of professional knowledge and skills at the site scale. Topics include site planning principles, social factors in design, introduction to principles of planting design and architectural structures, facilitation and computer applications in design.

LARC*6040 Landscape Architecture Studio IV W [0.50]

Studio instruction emphasizes design implementation, materials and methods of construction, principles of stormwater management, construction specifications and graphic communication using computer applications.

LARC*6120 Community Design W [0.50]

Studio and field instruction emphasizes integration of ecological, social, cultural and historical factors in the comprehensive design of urban and special use landscapes at the neighbourhood and community scale.

LARC*6340 Landscape History Seminar F [0.25]

A lecture/seminar course focussed on the history of Landscape Architecture. Skills emphasize the development of oral and writing skills.

LARC*6360 Professional Practice Seminar F [0.25]

A lecture/seminar course focussed on the legal, business, ethical and professional practices of Landscape Architecture professionals. Skills emphasize the development of oral and writing skills.

LARC*6380 Research Seminar W [0.25]

A seminar course focussed on the process and communication of research, influenced by the current research of the participants. Participants organize a conference to present their research results.

LARC*6430 Landscape Resource Analysis F [0.50]

Integrated field and classroom instruction introduces the student to inventory and analysis of biological, physical, social and cultural elements of the landscape. Projects will incorporate principles of landscape ecology and landscape planning. Field study will require some travel at student's expense.

LARC*6440 Environmental Design F [0.50]

This course integrates field and classroom study to apply landscape ecology to current landscape problems, including analysis of regional landscapes, restoration of degraded landscapes, and application of aesthetic and ecological principles across scales in site to regional settings. Case studies component will require some travel at students' expense.

LARC*6470 Integrative Environmental Planning W [0.50]

Landscape planning emphasizing the integration and interrelationships between biophysical and cultural resources, with application at a regional landscape planning scale. This course typically incorporates community-outreach projects.

LARC*6600 Critical Inquiry & Research Analysis W [0.50]

Students are introduced to critical inquiry as a method of evaluating information, design, and planning. The focus of the course is on the quantification and analysis of research data. Modelling and simulation are introduced and discussed in the context of planning, design, and research.

LARC*6610 Research Methods F [0.50]

An introduction to a broad array of research methods as they apply to landscape planning and design, with a focus on the connections between research and design. Emphasis is on developing foundations for the creation of appropriate research questions.

LARC*6710 Special Study S,F,W [0.50]

Independent study. A proposal for the content and product required for this course must be developed in conjunction with the student's Advisory Committee.

Latin American and Caribbean Studies

LACS*6000 Research Methods Seminar U [0.50]

This course will introduce students to the field and research methods of various disciplines and of interdisciplinary studies, and it will familiarize them with field-relevant research skills and methodologies.

LACS*6010 Latin American Identity & Culture I F [0.50]

This is the first of the two required LACS culture core courses. They will address theoretical issues relevant to Latin American identities and cultures, and will use these as heuristic devices in the study of major and marginalized cultural events, narratives, and visual and musical expressions. In LACS*6010 students will analyze the concept of "hybridity" and study how hybrid culture has been incorporating past with the present, and how it is and has been incorporating local and African forms and themes with European and US derived high culture.

LACS*6020 Latin American Identity & Culture II W [0.50]

This course is a continuation of LACS*6010. Students going on an exchange may replace this course with a similar course taken at the exchange university. This course will study minority cultures and the relationship of the periphery and the centre. Feminist, queer, Latina/o and indigenous marginalized cultures will be studied in the context of Internationalism and Globalization.

LACS*6030 Globalization & Insecurity in the Americas F [0.50]

An analytical,critical and inerdisciplinary introductory overview of Latin America and the Caribbean in the larger context of the Americas, from the point of view of the security and insecurity of its people. It will concentrate on the interplay of environmental, economic, social, political, and cultural factors upon such security in an era of globalization.

LACS*6040 Novel & Nation in Spanish America U [0.50]

This course will study the constitution of Spanish American nation in the novel since 1900 from a variety of theoretical perspectives. Particular attention will be paid to the novel's appropriation of foreign artistic and cultural influences to articulate Spanish American history.

LACS*6050 Globalization & Latin American Representation in Art W [0.50]

This course will examine the continuous flow of large, temporary high-profile identity-based "blockbuster" exhibitions based on Latin American and Caribbean art in Canada and the United States. These exhibitions play a key role as cultural agents, and raise questions of the concept of converging visual cultures.

LACS*6100 Research Project U [1.00]

This research project will result in a major paper of about 15,000 words. The student chooses a topic and writes a paper on the topic with the guidance of a faculty member. The topic must be approved by the Graduate Committee.

LACS*6200 Topics in Latin American and Caribbean Studies U [0.50]

An independent study course, the nature and content of which is agreed upon between the individual student and the person offering the course.

Restriction(s): Instructor and Graduate Co-ordinator signatures required. Course cannot be taken in first semester.

Leadership Studies

LEAD*6000 Foundations of Leadership S [0.50]

The course will enhance participants' interpersonal competency, as well as their knowledge and understanding of the theory and research underlying the impact of team management and collaboration on the organization.

Restriction(s): CME Executive Programs students only

LEAD*6100 Theories of Leadership F [0.50]

This course traces the development of the concept of leadership. Through the interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership.

Restriction(s): CME Executive Programs Students Only

LEAD*6200 Leadership of Organizational Change F [0.50]

This course studies the role of leadership in the management of change within an organization and the changes required of management. The course examines the development of trust, the building of organizational loyalty, and motivation and inspiring of high performance teams.

Restriction(s): CME Executive Programs students only

LEAD*6220 Strategic Leadership and Management U [0.50]

As a research intensive course in the MA Leadership, this course examines the conceptual and practical dimensions of strategic leadership and management in a variety of organizational, external and individual contexts using a selection of readings, discussions, case analyses and a final paper.

LEAD*6300 Role of the Leader in Decision-Making W [0.50]

The role of the leader in decision-making is explored through the study of the rational model for decision-making, human biases, creativity, and risk and uncertainty in decision-making. The course will also examine ethical issues and group decision-making.

Restriction(s): CME Executive Programs students only

LEAD*6350 The Role of the Leader as Reflective Practioner F [0.50]

This course will enhance the leader's ability to navigate the complexity of organizational life and contribute to building a more sustainable society by developing skills in reflective practice. Reflective practice is divided into four areas that stretch over eight modules: Rethinking, Relating, Responding and Reinventing.

Restriction(s): CME Executive Programs students only

LEAD*6400 Research Methods for Decision-Making W [0.50]

The course will explore both quantitative and qualitative techniques used in the analysis of research results from a variety of sources (surveys, government statistics, in-depth interview, focus groups and program evaluation results). Case studies will be used to demonstrate the application of multiple research methods.

Restriction(s): CME Executive Programs students only

LEAD*6500 Ethics in Leadership F [0.50]

Issues in the use and application of ethical standards by leaders are explored through examples from history, current events, novels, films and television. Relevant theory is applied to leadership examples to help students develop an ethical framework for the exercise of leadership skills.

Restriction(s): CME Executive Programs students only

LEAD*6720 Politics of Organizations F [0.50]

This elective course reviews a variety of theories and models that help to explain the behavioural underpinnings that influence and shape management and leadership processes within organizations. Examples from history and current events are explored to illustrate theory.

Restriction(s): CME Executive Programs students only

LEAD*6740 Coaching and Developing Others F [0.50]

This course will provide student with an opportunity to design developmental plans for direct reports, assess their coaching skills, and develop their coaching skills to support the development of others.

Restriction(s): CME Executive Programs students only

LEAD*6800 Personal Skill Self-Assessment S [0.50]

Using the "Basis of Competence" model, this course examines personal skills in four areas: Managing Self, Communicating, Managing People and Tasks, and Mobilizing Innovation and Change. The skills required to make smooth transitions from one job to another in a dynamic workplace will be explored.

Restriction(s): CME Executive Programs students only

LEAD*6900 Major Research Project W-S [1.00]

This course involves a directed research project leading to a referenced, professional report on a leadership problem or issue.

Restriction(s): CME Executive Programs students only

Land Resource Science

LRS*6000 Physical Environment of Crops and Forests F [0.50]

Recent literature on temperature, humidity, radiation, wind, gases and particles in crop and forest environments; evapotranspiration and photosynthesis of plant communities; modification of microclimates; applied micrometeorology. Offered in even-numbered years.

LRS*6040 Micrometeorology W [0.50]

Exchanges of mass, momentum and energy between the surface and the atmosphere will be studied in the context of larger-scale meterology. Diffusion and turbulence in and above plant canopies will be examined from theoretical and practical perspectives. Topics include time-series analysis, micrometeorological measurement theory, and basic principles of atmospheric science. Offered in even-numbered years.

LRS*6060 Meteorological Instrumentation W [0.50]

Theoretical and practical aspects of electronic circuits, sensors, and equipment used in meteorological research.

LRS*6241 Special Topics in Atmospheric Science F,U [0.25]

The content is determined by the interests of the students and the availability of instructors. Topics may include aspects of statistics for climatology, animal biometeorology, air pollution meteorology, and hydrometeorology.

LRS*6242 Special Topics in Atmospheric Science F,U [0.50]

See LRS*6241

LRS*6250 Soil Genesis and Classification F [0.50]

A discussion of world soil regions for students not specializing in soil genesis.

LRS*6280 Soil Physics W [0.50]

The soil as a physical system with special regard to soil water movement and the diffusion and dispersion of chemical substances. Numerical techniques and computer solutions will be developed.

LRS*6300 Applied Soil Physics F [0.50]

The application of soil physical principles to practical problems concerning soil physical quality, erosion, land reclamation and industrial-waste disposal on land

Prerequisite(s): SOIL*3070.

LRS*6320 Non-equilibrium Thermodynamics of Porous Media W [0.50]

Transport processes in porous media such as soils, clays, and membranes are dealt with in the framework of non-equilibrium thermodynamics with emphasis on the coupling between water, solutes, heat and electric charge transport. Offered in even-numbered years.

LRS*6340 Soil Organic Matter and Biochemistry F [0.50]

(1) Soil organic matter characterization, (2) dynamics of soil organic matter, (0.5) nutrient cycling. Offered in odd-numbered years.

LRS*6360 Soil and Water Chemistry F [0.50]

Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.

LRS*6380 Advanced Soil Chemistry W [0.50]

The mathematical development of solute speciation models for aqueous solutions, surface complexation models for inorganic soil constituents and descrete and continuous functional group models for humic materials.

LRS*6400 Soil Nitrogen Fertility and Crop Production W [0.50]

Emphasis will be placed on soil N transformations and processes, and N sources for crops; field experimentation methods; environmental issues.

LRS*6420 Soil Productivity F [0.50]

Soil physical, chemical and biological characteristics as they influence crop growth with emphasis on processes and mechanisms.

LRS*6440 Field Sampling Strategies and Geostatistics W [0.50]

Concepts and practical aspects of collecting, synthesizing and interpreting data from spatially and temporally variable and/or correlated fields. Hands-on experience in describing spatial structure of large data sets (supplied by student or instructor) using available software. Offered in even-numbered years.

LRS*6500 Land Resource Science Research Project U [1.00]

A concise, critical review of an area of study related to the field chosen by the student including analyses and interpretation of relevant data. The project will be written in the form of a scientific paper and presented to the department as a seminar.

Restriction(s): Available only to students registered in LRS MSc by coursework.

LRS*6581 Special Topics in Soil Science U [0.25]

Issues that are relevant to the current research of faculty or visiting faculty. Generally presented as a combination of lectures, student seminars and written projects.

LRS*6582 Special Topics in Soil Science U [0.50]

See LRS*6581

LRS*6700 Glacial Sedimentary Environments U [0.50]

Students will learn about the processes and deposits of glacial environments as well as the use of sedimentary records to reconstruct past glacial environments. Case studies from modern to ancient glacial seimentary environments will be used. Field trip included. (Offered only as needed)

LRS*6710 Advanced Sedimentology F [0.50]

Topics covered through case studies of sedimentary deposits and environments include facies analysis, large scale controls, and novel techniques in sedimentology. Topics may also include specific sedimentary envionments or specific sedimentary deposits such as turbidites, cross-bedded strata or seismites depending on student interest. (Offered only as needed)

LRS*6730 Special Topics in Environmental Earth Science U [0.50]

A study of principles and analyses of local environmental problems involving the application of geological and soil information of land use applications and possible hazardous conditions.

LRS*6881 Special Topics in Land Resources Management U [0.25]

Issues that are relevant to the current research of faculty or visiting faculty. Generally presented as a combination of lectures, student seminars and written projects.

LRS*6882 Special Topics in Land Resources Management U [0.50]

See LRS*6881

LRS*6900 Research Issues I F [0.25]

Principles and philosophy of scientific research including the development of superior communication skills.

LRS*6910 Research Issues II W [0.25]

A continuation of Research Issues I.

Literature and Theatre Studies

LTS*7770 Language Requirement U [0.00]

A written demonstration of a student's reading knowledge of one language other than English, as approved by the Graduate Studies Committee.

LTS*7900 Directed Studies U [0.50]

The study of a special topic under the guidance of a member of the graduate faculty.

Management

MGMT*6800 Philosophy of Social Science Research F [0.50]

This course introduces students to the underlying philosophical assumptions that support empirical research methods within social science disciplines. The aim of this course is to examine the philosophy of knowledge generation and claims, particularly in the context of management phenomena.

MGMT*6820 Theory of Management F [0.50]

This course examines the evolution of management thought and the overarching theories that have been successfully applied to multiple functional areas of the organization. Examples of theories that apply to such disparate areas as operations, marketing, and organizational behaviour include agency theory, transaction cost analysis, and contingency theory.

Marketing and Consumer Studies

MCS*6000 Consumption Behaviour Theory I F [0.50]

A review of the nature and scope of consumption behaviour and the approaches to studying the role of human consumption using the major theoretical perspectives.

MCS*6010 Consumption Behaviour Theory II W [0.50]

Consumption behaviour is an interdisciplinary field of study which applies theories from multiple disciplines to the activities and processes people engage in when choosing, using and disposing of goods and services. The purpose of this course is to provide a basic review of the theoretical foundations of aspects of consumption and consumer behaviour and to demonstrate their applicability to marketing management. The course is designed to allow participants to bring their own background and interests to bear on the review and application of the theories underlying consumer behaviour.

Prerequisite(s): MCS*6000 or consent of instructor

MCS*6050 Research Methods in Marketing and Consumer Studies F [0.50]

A comprehensive review of measurement theory, including issues such as construct definition, scale development, validity and reliability. Applicants of measurement principles will be demonstrated, particularly as they relate to experimental and survey research design.

MCS*6060 Multivariate Research Methods W [0.50]

A review of selected multivariate analysis techniques as applied to marketing and consumer research. Topics include regression, anova, principal components, factor and discriminant analysis, nonmetric scaling and trade-off analysis. The course uses a hands-on approach with small sample databases available for required computer-program analysis.

Prerequisite(s): MCS*6050 or consent of instructor

MCS*6070 Introduction to Structural Equation Modeling F [0.50]

This course introduces students to the theory, concepts and application of structural equation modeling. Topics covered include path analysis, confirmatory factor analysis and measurement models, latent variable modeling, multi-group modeling, and measurement invariance testing. Emphasis is placed on applying the principles of SEM to the creation and testing of theoretically driven models using both categorical and continuous data.

MCS*6080 Qualitative Research Methods W [0.50]

A review of the nature, importance and validity issues associated with qualitative research. Topics include theory and tactics in design, interpersonal dynamics, analysis of interaction and transcripts.

Prerequisite(s): MCS*6050 or consent of instructor

MCS*6090 Special Topics in Consumer Research and Analysis U [0.50]

MCS*6100 Marketing Theory F [0.50]

A theoretical understanding of marketing, including philosophy of science and marketing, a history of marketing thought, market orientation, marketing strategy theory, modeling, social marketing, and ethical issues in marketing.

Restriction(s): Signature required for non-MCS students.

MCS*6120 Marketing Management U [0.50]

This course is designed to increase depth of knowledge of marketing by helping the student understand how marketing theory can directly affect marketing practice and firm performance. As this is an MSc course and NOT an MBA course, there is an expectation that the level of critical thinking and knowledge growth falls within the realm of the science of marketing and/or the empirical nature of marketing research and is not simply about marketing practice.

Prerequisite(s): MCS*6100

MCS*6260 Special Topics in Food Marketing U [0.50]

MCS*6500 Global Business Today U [0.50]

This course will survey the key issues related to doing business internationally including the cultural context for global business, cross border trade and investment, ethics, the global monetary system, foreign exchange challenges and effectively competing in the global environment.

Restriction(s): Non MBA/MA Leadership students only by permission of Executive Programs Office.

MCS*6710 Special Topics in Marketing U [0.50]

MCS*6720 Special Topics in Housing and Real Estate U [0.50]

MCS*6950 Marketing & Consumer Studies Seminar F,W [0.00]

Mathematics

MATH*6010 Analysis U [0.50]

Half the course covers metric spaces, normed linear spaces, and inner product spaces, including Banach's and Schauder's fixed point theorems, Lp spaces, Hilbert spaces and the projection theorem. The remaining content may include topics like operator theory, inverse problems, measure theory and spectral analysis.

MATH*6011 Dynamical Systems I U [0.50]

Basic theorems on existence, uniqueness and differentiability; phase space, flows, dynamical systems; review of linear systems, Floquet theory; Hopf bifurcation; perturbation theory and structural stability; differential equations on manifolds. Applications drawn from the biological, physical, and social sciences.

MATH*6012 Dynamical Systems II U [0.50]

The quantitative theory of dynamical systems defined by differential equations and discrete maps, including: generic properties; bifurcation theory; the center manifold theorem; nonlinear oscillations, phase locking and period doubling; the Birkhoff-Smale homoclinic theorem; strange attractors and deterministic chaos.

MATH*6020 Scientific Computing U [0.50]

This course covers the fundamentals of algoithms and computer programming. This may include computer arithmetic, complexity, error analysis, linear and nonlinear equations, least squares, interpolation, numerical differentiation and integration, optimization, random number generators, Monte Carlo simulation; case studies will be undertaken using modern software.

MATH*6021 Optimization I U [0.50]

A study of the basic concepts in: linear programming, convex programming, non-convex programming, geometric programming and related numerical methods.

MATH*6022 Optimization II U [0.50]

A study of the basic concepts in: calculus of variations, optimal control theory, dynamic programming and related numerical methods.

MATH*6031 Functional Analysis U [0.50]

Review of metric, normed, and inner product spaces; Banach contraction principle; brief introduction to measure and integration; elementary Fourier analysis; adjoint and compact operators; nonlinear operators and the Frechet derivative; Baire category theorem; principle of uniform boundedness; open mapping theorem; principle ot uniform boundedness; closed graph theorem.

MATH*6041 Partial Differential Equations I U [0.50]

Classification of partial differential equations. The Hyperbolic type, the Cauchy problem, range of influence, well- and ill-posed problems, successive approximation, the Riemann function. The elliptic type: fundamental solutions, Dirichlet and Neumann problems. The parabolic type: boundary conditions, Green's functions and separation of variables. Introduction to certain non-linear equations and transformations methods.

MATH*6042 Partial Differential Equations II U [0.50]

A continuation of some of the topics of Partial Differential Equations I. Also, systems of partial differential equations, equations of mixed type and non-linear equations.

MATH*6051 Mathematical Modelling U [0.50]

The process of phenomena and systems model development, techniques of model analysis, model verification, and interpretation of results are presented. The examples of continuous or discrete, deterministic or probabilistic models may include differential equations, difference equations, cellular automata, agent based models, network models, stochastic processes.

MATH*6071 Biomathematics U [0.50]

The application of mathematics to model and analyze biological systems. Specific models to illustrate the different mathematical approaches employed when considering different levels of biological function.

MATH*6091 Topics in Analysis U [0.50]

Selected topics from topology, real analysis, complex analysis, and functional analysis.

MATH*6181 Topics in Applied Mathematics I U [0.50]

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in applied mathematics under the guidance of graduate faculty. Course topics will normally be advertised by faculty in the semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats.

MATH*6182 Topics in Applied Mathematics II U [0.50]

This course provides graduate students, either individually or in groups, with the opportunity to pursue topics in applied mathematics under the guidance of graduate faculty. Course topics will normally be advertised by faculty in the semester prior to their offering. Courses may be offered in any of lecture, reading/seminar, or individual project formats.

MATH*6400 Numerical Analysis I U [0.50]

Topics selected from numerical problems in: matrix operations, interpolation, approximation theory, quadrature, ordinary differential equations, partial differential equations, integral equations, nonlinear algebraic and transcendental equations.

MATH*6410 Numerical Analysis II U [0.50]

One or more topics selected from those discussed in Numerical Analysis I, but in greater depth.

MATH*6990 Mathematics Seminar U [0.00]

Students will review mathematical literature and present a published paper.

MATH*6998 MSc Project in Mathematics U [1.00]

Molecular and Cellular Biology

MCB*6100 Research Topics in Molecular and Cellular Biology U [0.50]

The development and refinement of the skills of scientific communication, emphasizing writing skills, in the context of developing a thesis proposal. This course is mandatory for all students in the MCB graduate program and is normally completed within the first two (2) semesters of the program, and must be taken with the accompanying course MCB*6200.

MCB*6200 Scientific Communication in Molecular and Cell Biology U [0.50]

The development and refinement of the skills of scientific communication emphasizing oral presentation. Students will present a public seminar on a contemporary subject in the molecular biosciences culminating in a description of the proposed research. This course is mandatory for all students in the MCB program and must be taken with the accompanying course MCB*6100.

MCB*6310 Advanced Topics in Developmental and Cellular Biology U [0.50]

A study of selected topics in contemporary developmental and cellular biology. Students will review recent advances in these disciplines at the molecular and cellular level, in biological systems ranging from simple eukaryotes to plants and vertebrates.

MCB*6320 Advanced Topics in Microbiology U [0.50]

A study of selected topics in contemporary microbiology. Students will review recent advances in microbial cell structure, physiology, interactions, gene expression and virulence.

MCB*6330 Molecular Biology of Viruses U [0.50]

Replication strategies of virus genomes including prototypes of different animal, plant and (some) bacterial virus families; mechanism and control of viral gene expression; tumour virology; genetically engineered virus vaccines.

MCB*6340 Advanced Topics in Molecular Genetics U [0.50]

A study of selected topics in contemporary molecular biology and molecular genetics. Students will review recent progress in gene expression and regulation in model organisms, and the application of molecular biology tools to the study of cellular and organismal physiology.

MCB*6350 Advanced Topics in Plant Biology U [0.50]

A study of selected contemporary topics in biochemistry and molecular biology. Proposed course descriptions are considered by the Department of Molecular and Cellular Biology on an ad hoc basis, and the course will be offered according to demand.

MCB*6360 Advanced Topics in Biochemistry and Molecular Biology U [0.50]

A study of selected contemporary topics in biochemistry and molecular biology. Proposed course descriptions are considered by the Department of Molecular and Cellular Biology on an *ad hoc* basis, and the course will be offered according to demand.

MCB*6370 Protein Structural Biology and Bioinformatics U [0.50]

This course explores structural biology from three perspectives: 1) the fundamental concepts in structural biology; 2) the methods used to determine structures (including x-ray crystallography, NMR, electron microscopy, and computational modeling); 3) the bioinformatic concepts and tools used to compare, contrast and assign biochemical function to protein structures and sequences. The course emphasizes building a conceptual and practical skill set that will be applicable to any structure related problem.

MCB*6380 Structure and Function of Biological Membranes U [0.50]

This course covers multidisciplinary investigations of the basic structure and function of membranes in relation to cell biology. Topics will include structural biology of membrane proteins, experimental approaches for studying membranes, membrane transport systems, import-export systems and/or membrane trafficking.

Neuroscience

NEUR*6000 Principles of Neuroscience U [0.50]

This course is designed to ensure that graduate students with diverse neuroscience backgrounds registered in the Collaborative Program in Neuroscience are exposed to the fundamentals in all areas of neuroscience.

NEUR*6100 Seminar in Neuroscience U [0.00]

This course will expose graduate students to some of the major theories, issues and methodologies driving research in neuroscience. Students will learn to critically evaluate presentations by researchers in this field as well as to communicate the results of their own research.

Pathobiology

PABI*6000 Bacterial Pathogenesis F [0.50]

An overview of key concepts in bacterial pathogenesis with emphasis on veterinary and zoonotic pathogens.

PABI*6030 Applied Clinical Pathology I F,W,S [0.50]

Preparation and description of materials, and interpretation of data involved in hematology, cytology, and clinical chemistry from clinical cases. (Intended for students majoring in clinical pathology)

PABI*6040 Applied Clinical Pathology II U [0.50]

A continuation of PABI*6030 with greater depth in the interpretation of data involved in hematology, cytology and clinical chemistry from clinical cases. (Intended for students majoring in clinical pathology).

PABI*6041 Applied Clinical Pathology III U [0.50]

A continuation of PABI*6040 with greater depth in the interpretation of data involved in hematology, cytology and clinical chemistry from clinical cases. (Intended for students majoring in clinical pathology).

PABI*6050 Applied Avian Pathology I F [0.50]

Examination and interpretation of gross and microscopic lesions of domestic poultry.

PABI*6060 Applied Avian Pathology II W [0.50]

A continuation of PABI*6050, emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter and early spring conditions.

PABI*6070 Applied Avian Pathology III S [0.50]

A continuation of PABI*6060, emphasizing seasonal differences in diseases as well as diseases more commonly associated with late spring and summer conditions.

PABI*6080 Diagnostic Pathology I - Domestic Animals S,F,W [0.50]

An introducatory course of diagnostic pathology with emphasis on the common and uncommon diseases of the whole body and respiratory, urinary, and digestive (including liver and pancreas) systems.

PABI*6090 Diagnostic Pathology II - Domestic Animals S,F,W [0.50]

An intermediate course that builds on the skills acquired in PABI*6080 and further enhances diagnostic veterinary pathology skills to include disease of the nervous, endocrine and muscoloskeletal systems.

PABI*6091 Diagnostic Pathology III - Domestic Animals S,F,W [0.50]

An advanced course that builds on the skills acquired in PABI*6090 and further enhances diagnostic beterinary patology skills to include diseases of all organ systems.

PABI*6100 Immunobiology F [0.50]

Major areas of immunology, including initiation, regulation, receptors, genetics, immune system development and function.

PABI*6104 Mechanisms of Disease F [0.50]

Molecular, cellular and tissue processes involved in the pathogenesis of adaptive, degenerative, inflammatory, proliferative and neoplastic diseases. (Odd-numbered years)

PABI*6105 Integrative Pathology U [0.50]

Basic and interpretive tissue and biochemical concepts of disease in the liver, pancreas, kidney, endocrine and hemiclymphatic systems. (Even-numbered years)

Restriction(s): Instructor's signature required

PABI*6110 Pathology I W [0.50]

Disease processes of the respiratory, integumentary, reproductive and skeletal systems. (Even-numbered years)

PABI*6130 Pathology II W [0.50]

Disease processes of the alimentary, central-nervous, cardiovascular and muscular systems and special senses. (Odd-numbered years)

PABI*6180 Clinical Bacteriology U [0.50]

Current techniques and approaches in diagnostic bacteriology.

PABI*6190 Topics in Immunology W [0.50]

Aspects of immune and non-specific host resistance, diagnostic immunology and immune-mediated disease.

PABI*6221 Comparative Veterinary Pathology I U [0.50]

Pathological changes associated with diseases of amphibia, reptiles, wild and captive non-domestic birds, and wild mammals including fur-bearers. (Even numbered years)

Restriction(s): Instuctor's signature required

PABI*6222 Comparative Veterinary Pathology II U [0.50]

Pathological changes associated with diseases of poultry and pet birds, fish and various laboratory animals. (Even numbered years)

Restriction(s): Instructor's signature required

PABI*6300 Clinical Pathology I W [0.50]

A study of diagnostic hematology and cytology, with emphasis on the hematopoietic system.

PABI*6320 Clinical Pathology II W [0.50]

Clinical biochemistry of selected organ systems including the renal, hepatic, pancreatic and endocrine organ systems.

PABI*6330 Viral Diseases F [0.50]

A study of important viral diseases of animals, with emphasis on etiology, host responses, diagnosis and control. (Odd numbered years)

PABI*6350 Molecular Epidemiology of Bacterial Diseases W [0.50]

This is a basic introduction to molecular epidemiology of bacterial diseases. It provides an understanding of molecular epidemiology methodologies and of their use for improving our understanding of infectious diseases epidemiology and control.

Prerequisite(s): STAT*2040 Statistics I
Restriction(s): Lab component: limited number of participants and WHIMIS certificate compulsory.

PABI*6440 Graduate Seminar in Pathobiology S,F,W [0.50]

Following discussions of approaches to scientific research and communication, students will submit a thorough written critical review of the literature on an agreed upon topic that leads to a detailed research proposal. This material will also be presented in the form of a public seminar.

PABI*6500 Infectious Diseases and Public Health F [0.50]

Prevention and control of infectious diseases is an important aspect of public health. This course will involve detailed discussion of selected infectious diseases of public health concern, excluding zoonotic diseases. Relevant aspects of microbiology, epidemiology, clinical presentation, diagnosis and treatment will be covered, with additional emphasis on prevention and control.

Restriction(s): Restricted to students in Public Health programs.

PABI*6550 Epidemiology of Zoonoses W [0.50]

Characterization and distribution of diseases common to people and animals.

PABI*6630 Applied Comparative Pathology I U [0.50]

A study of problems in, as well as the examination of, lesions found in diseases of fish and wildlife, including amphibia and reptiles, drawn from naturally occurring cases assigned for detailed investigation. The student may be required to prepare a critical review of a specific disease entity.

PABI*6640 Applied Comparative Pathology II U [0.50]

A continuation of PABI*6630 emphasizing seasonal differences in diseases as well as diseases more commonly associated with winter and early spring conditions.

PABI*6650 Applied Comparative Pathology III U [0.50]

A continuation of PABI*6640 emphasizing seasonal difference in diseases as well as diseases more commonly associated with late spring and summer conditions.

PABI*6700 Laboratory Animal Science U [0.50]

Basic information on various aspects of laboratory animal science, including IACUC function, regulatory oversight, ethics, historical review of animal research, animal models and alternatives, experimental design and considerations, biology, management and uses of common species in research.

PABI*6710 Applied Laboratory Animal Science I U [0.50]

This course will emphasize practical aspects of laboratory animal science including research protocol review, writing and reviewing standard operating procedures, animal monitoring, pathology procedures, and case management.

PABI*6720 Applied Laboratory Animal Science II U [0.50]

Continuation of I with emphasis on biohazard and personnel safety, monitoring for disease, quality control and diagnostic procedures.

PABI*6730 Applied Laboratory Animal Science III U [0.50]

Continuation of I and II, with emphasis on a comparison of programs and procedures in other facilities in Canada, nonhuman primate medicine, and surgical, clinical and necropsy procedures.

PABI*6740 Avian Diseases U [0.50]

Detailed study of recent concepts of preventive medicine, diagnosis and therapeutics as applied to clinical recognition and control of avian diseases.

Restriction(s): Instructor's signature required

PABI*6960 Special Topics in Pathobiology F,W,S [0.50]

In-depth independent study of subjects related to student's principal area of interest. Major paper(s), laboratory studies, and/or written and oral examination, with or without seminar preparation.

Restriction(s): Instructor's signature required

Philosophy

PHIL*6000 Value Theory U [0.50]

A critical examination of some selected contemporary works in value theory or aesthetics.

PHIL*6060 Logic U [0.50]

A course designed to bring the individual student to the level of competence in logical techniques and theory required for graduate studies.

PHIL*6110 Philosophy of Religion U [0.50]

A critical examination of some selected major works or central problems in the philosophy of religion.

PHIL*6120 Philosophy of Mind U [0.50]

A study of contemporary theories of mind and philosophies of psychology.

PHIL*6140 Contemporary European Philosophy I U [0.50]

A study of the historical and contemporary origins of existentialism, phenomenology and post-modernism, concentrating on one or several of the classic texts.

PHIL*6150 Contemporary European Philosophy II U [0.50]

A study of the historical and contemporary origins of existentialism, phenomenology and post-modernism, concentrating on texts not covered in PHIL*6140 in the same year.

PHIL*6200 Problems of Contemporary Philosophy U [0.50]

A study of a particular set of problems in contemporary philosophy.

PHIL*6210 Metaphysics U [0.50]

A critical examination of some selected major works or central problems in metaphysics.

PHIL*6220 Epistemology U [0.50]

A critical examination of some selected major works or central problems in epistemology.

PHIL*6230 Ethics U [0.50]

A critical examination of some selected contemporary works or problems in ethical theory.

PHIL*6240 Biomedical Ethics U [0.50]

A critical examination of some selected contemporary works or of problems in biomedical ethics.

PHIL*6310 Plato U [0.50]

A study of some of the major works of Plato.

PHIL*6311 Aristotle U [0.50]

A study of some of the major works of Aristotle.

PHIL*6320 Medieval Philosophy U [0.50]

A close examination of particular problems and texts of the medieval period

PHIL*6340 Modern Philosophy U [0.50]

An examination of major texts, from Descartes to Mill.

PHIL*6500 John Locke U [0.50]

A critical examination of the works of John Locke.

PHIL*6530 Kant U [0.50]

A critical examination of the works of Immanuel Kant.

PHIL*6600 Social and Political Philosophy U [0.50]

A critical examination of some selected contemporary works or central problems in the field of social philosophy.

PHIL*6700 Survey of Ancient Philosophy U [0.50]

A survey of ancient philosophy.

PHIL*6710 Survey of Early Modern Philosophy U [0.50]

A survey of modern philosophy from Hobbes to Hume.

PHIL*6720 History of the Philosophy of Science U [0.50]

A survey of the history of the philosophy of science from the Presocratics to the Positivists.

PHIL*6730 Contemporary Philosophy of Science U [0.50]

An examination of the contemporary discipline of the philosophy of science.

PHIL*6740 Philosophy of Biology U [0.50]

A general introduction to the history and philosophy of biology.

PHIL*6760 Science and Ethics U [0.50]

A consideration of the problems which arise in the conjunction of science and ethics.

PHIL*6810 Survey of Late Modern Philosophy U [0.50]

A survey of modern philosophy from Kant to the late 19th century.

PHIL*6900 Reading Course U [0.50]

PHIL*6930 Selected Topics I U [0.50]

Topics in this course will vary from offering to offering.

PHIL*6940 Selected Topics II U [0.50]

Topics in this course will vary from offering to offering.

PHIL*6950 MA Seminar U [0.50]

A seminar course in which students work on developing a range of academic skills for doing professional philosophy. This course is pass/fail and is mandatory for all incoming MA students. Please refer to the Philosophy Department website for a comprehensive description of this course.

PHIL*6960 PhD Graduate Seminar U [0.50]

A seminar course in which students work on developing a range of academic skills for doing professional philosophy. This course is pass/fail and is mandatory for all second year PhD students. Please refer to the Philosophy Department website for a comprehensive description of this course.

PHIL*6990 Guided Research Project U [1.00]

A guided research project undertaken by students doing an MA by course work, under the supervision of a faculty member.

Physics

PHYS*6010 PSI Quantum Field Theory I U [0.50]

Canonical quantization of fields, perturbation theory, derivation of Feynman diagrams, applications in particle and condensed matter theory, renormalization in phi^4.

PHYS*6020 PSI Statistical Physics U [0.50]

A brief review of ensembles and quantum gases, lsing model, landau theory of phase transitions, order parameters, topology, classical solutions.

PHYS*6030 PSI Quantum Field Theory II U [0.50]

Feynman Path Integral, abelian and nonabelian guage theories and their quantization, spontaneous symmetry breaking, nonperturbative techniques: lattice field theory, Wilsonian renormalization.

PHYS*6040 PSI Relativity U [0.50]

Special relativity, foundations of general relativity, Riemannain geometry, Einstein's equations, FRW and Schwarzschild geometries and their properties.

PHYS*6050 PSI Quantum Theory U [0.50]

Schrodinger equation: free particle, harmonic oscillator, simple time-dependent problems, Heisenberg picture and connection with classical physics. Entanglement and non-locality. Pure and mixed states, quantum correlators, measurement theory and interpretation.

PHYS*6060 PSI Information and Data Analysis U [0.50]

Probability, entropy, Bayesian inference and information theory. Maximum likelihood methods, common probability distributions, applications to real data including Monte Carlo methods.

PHYS*6070 PSI Dynamical Systems U [0.50]

Maps, flows, stability, fixed points, attractors, chaos, bifurcations, ergodicity, approach to chaos. Hamiltonian systems, Liouville, measure, Poincare theorem, integrable systems with examples.

PHYS*6080 PSI Computation U [0.50]

Common algorithms for ode and pde solving, with numerical analysis. Common tasks in linear algebra. Focus on how to write a good code, test it, and obtain a reliable result. Parallel programing.

PHYS*6210 PSI Cosmology U [0.25]

FRW metic, Hubble expansion, dark energy, dark matter, CMB, Thermodynamic history of early universe. Growth of perturbations, CDM model of structure formation and comparison to observations, cosmic microwave background anisopropies, inlation and observational tests.

PHYS*6220 PSI Standard Model U [0.25]

Application of Yan-Mills theory to particle physics, QCd and its tests in the perturbative regime, theory of weak interactions, precisions tests of electroweak theory, CKD matrix and flavour physics, open questions.

PHYS*6230 PSI String Theory U [0.25]

Superstring spectrum in 10d Minkowski, as well as simple toroidal and orbifold compactifications. T-duality, D-branes, tree amplitudes. Construct some simple unified models of particle physics. Motivate the 10- 11-dimensional supergravities. Simple supergravity solutions and use these to explore some aspects of adS/CFT duality.

PHYS*6240 PSI Mathematical Physics Topics U [0.25]

Differential forms, de Rham cohomology, differential topology and characteristic classes, monopoles and instantons, Kahler manifolds, Dirac equations, zero modes and index theorems.

PHYS*6350 PSI Quantum Information Review U [0.25]

Review of selected topics in Quantum Information.

PHYS*6360 PSI Gravitational Physics Review U [0.25]

Review of selected topics in Gravitational Physics.

PHYS*6370 PSI Condensed Matter Theory U [0.25]

Review of selected topics in Condensed Matter Theory.

PHYS*6380 PSI Quantum Gravity U [0.25]

Review of selected topics in Quantum Grativity.

PHYS*6390 PSI Foundations of Quantum Theory U [0.25]

Review of selected topics in Foundations of Quantum Theory.

PHYS*6410 PSI Explorations in Quantum Information U [0.25]

Review of selected topics in Quantum Information.

PHYS*6420 PSI Explorations in Gravitational Physics U [0.25]

Review of selected topics in Gravitational Physics.

PHYS*6430 PSI Exploration in Condensed Matter Theory U [0.25]

Review of selected topics in Condensed Matter Theory.

PHYS*6440 PSI Exploration in Quantum Gravity U [0.25]

Review of selected topics in Quantum Gravity.

PHYS*6450 PSI Explorations in Foundations of Quantum Theory U [0.25]

Review of selected topics in Foundations of Quantum Theory.

PHYS*6460 PSI Explorations in Particle Physics U [0.25]

Review of selected topics in Particle Physics.

PHYS*6470 PSI Explorations in String Theory U [0.25]

Review of selected topics in String Theory.

PHYS*6480 PSI Explorations in Complex Systems U [0.25]

Review of selected topics in Complex Systems.

PHYS*6490 PSI Explorations in Cosmology U [0.25]

Review of selected topics in Cosmology.

PHYS*7010 Quantum Mechanics I * U [0.50]

Review of formalism of nonrelativistic quantum mechanics including symmetries and invariance. Approximation methods and scattering theory. Elementary quantum theory of radiation. Introduction to one-particle relativistic wave equations.

PHYS*7020 Quantum Mechanics II U [0.50]

Concepts of relativistic quantum mechanics, elementary quantum field theory, and Feynman diagrams. Application to many-particle systems.

Prerequisite(s): PHYS*7010 or equivalent

PHYS*7030 Quantum Field Theory U [0.50]

Review of relativistic quantum mechanics and classical field theory. Quantization of free quantum fields (the particle interpretation of field quants). Canonical quantization of interacting fields (Feynman rules). Application of the formalism of interacting quantum fields to lowest-order quantum electrodynamic processes. Radiative corrections and renormalization.

Prerequisite(s): PHYS*7010 or equivalent.

PHYS*7040 Statistical Physics I* U [0.50]

Statistical basis of thermodynamics; microcanonical, canonical and grand canonical ensembles; quantum statistical mechanics, theory of the density matrix; fluctuations, noise, irreversible thermodynamics; transport theory; application to gases, liquids, solids.

PHYS*7050 Statistical Physics II U [0.50]

Phase transitions. Fluctuation phenomena. Kubo's theory of time correlation functions for transport and spectral properties; applications selected from a variety of topics including linearized hydrodynamics of normal and superfluids, molecular liquids, liquid crystals, surface phenomena, theory of the dielectric constant, etc.

Prerequisite(s): PHYS*7040 or equivalent.

PHYS*7060 Electromagnetic Theory * U [0.50]

Solutions to Maxwell's equations; radiation theory, normal modes; multipole expansion; Kirchhoff's diffraction theory; radiating point charge; optical theorem. Special relativity; transformation laws for the electromagnetic field; line broadening. Dispersion; Kramers-Kronig relations. Magnetohydrodynamics and plasmas.

PHYS*7080 Applications of Group Theory U [0.50]

Introduction to group theory; symmetry, the group concept, representation theory, character theory. Applications to molecular vibrations, the solid state, quantum mechanics and crystal field theory.

PHYS*7090 Green's Function Method U [0.50]

Review of essential quantum field theory. Zero and finite temperature. Green's functions. Applications.

PHYS*7100 Atomic Physics U [0.50]

Emphasis on atomic structure and spectroscopy. Review of angular momentum, rotations, Wigner-Eckart theorem, n-j symbols. Energy levels in complex atoms, Hartree-Fock theory, radiative-transitions and inner-shell processes. Further topics selected with class interest in mind, at least one of which is to be taken from current literature.

PHYS*7120 Special Topics in Theoretical Physics U [0.50]

PHYS*7130 Molecular Physics U [0.50]

Angular momentum and the rotation of molecules; introduction to group theory with application to molecular vibrations; principles of molecular spectroscopy; spectra of isolated molecules; intermolecular interactions and their effects on molecular spectra; selected additional topics (e.g., electronic structure of molecules, experimental spectroscopic techniques, neutron scattering, correlation functions, collision induced absorption, extension of group theory to molecular crystals, normal co-ordinate analysis, etc.).

PHYS*7140 Nonlinear Optics U [0.50]

Classical and Quantum Mechanical descriptions of nonlinear susceptibility, nonlinear wave propogation, nonlinear effects such as Peckel's and Kerr effects, harmonic generation, phase conjugation and stimulated scattering processes.

PHYS*7150 Nuclear Physics U [0.50]

Static properties of nuclei; alpha, beta, gamma decay; two-body systems; nuclear forces; nuclear reactions; single-particle models for spherical and deformed nuclei; shell, collective, interacting boson models.

PHYS*7160 Special Topics in Subatomic and Nuclear Physics U [0.50]

Restriction(s): Instructor's signature required

PHYS*7170 Intermediate and High Energy Physics U [0.50]

Strong, electromagnetic and weak interactions. Isospin, strangeness, conservation laws and symmetry principles. Leptons, hadrons, quarks and their classification, formation, interactions and decay.

PHYS*7180 Special Topics in Subatomic and Nuclear Physics U [0.25]

Restriction(s): Instructor's signature required

PHYS*7310 Solid State Physics I U [0.50]

Phonons, electron states, electron-electron interaction, electron-ion interaction, static properties of solids.

PHYS*7320 Solid State Physics II U [0.50]

Transport properties; optical properties; magnetism; superconductivity; disordered systems.

PHYS*7330 Special Topics in Theoretical Condensed Matter Physics U [0.50]

PHYS*7370 Special Topics in Surface Physics U [0.50]

PHYS*7380 Special Topics in Condensed Matter and Materials Physics U [0.25]

PHYS*7450 Special Topics in Experimental Physics * U [0.50]

A modular course in which each module deals with an established technique of experimental physics. Four modules will be offered during the Winter and Spring semesters, but registration and credit will be in the spring semester. Typical topics are neutron diffraction, light scattering, acoustics, molecular beams, NMR, surface analysis, etc.

PHYS*7470 Optical Electronics U [0.50]

Optoelectronic component fabrication, light propogation in linear and nonlinear media, optical fiber properties, electro-optic and acousto-optic modulation, spontaneous and stimulated emission, semiconductor lasers and detectors, nose effects in fiber systems.

PHYS*7510 Cellular Biophysics U [0.50]

The physics of cellular structure and function; membrane theories, diffusion and active transport, bioelectric phenomena; intracellular motion, thermodynamics; selected topics of current interest and seminar.

PHYS*7520 Molecular Biophysics U [0.50]

Physical methods of determining macromolecular structure: energetics, intramolecular and intermolecular forces, with application to lamellar structures, information storage, DNA and RNA, recognition and rejection of foreign molecules.

PHYS*7540 Special Topics in Biophysics U [0.50]

Offered on demand

PHYS*7570 Special Topics in Biophysics U [0.25]

Offered on demand

PHYS*7670 Introduction to Quantum Information Processing F [0.50]

Quantum superposition, interference, and entanglement. Postulates of Quantum Mechanics. Quantum computational complexity. Quantum Algorithms. Quantum communication and cryptography. Quantum error correction. Implementations.

PHYS*7680 Special Topics in Quantum Information Processing U [0.50]

PHYS*7690 Special Topics in Quantum Information Processing U [0.25]

PHYS*7710 Special Lecture and Reading Course U [0.50]

PHYS*7730 Special Topics in Physics U [0.50]

PHYS*7750 Interinstitution Exchange U [0.50]

At the GWPI director's discretion, a PhD or MSc student may receive credit for a term of specialized studies at another institution. Formal evaluation is required.

Restriction(s): GWPI director approval required

PHYS*7760 Special Topics in Physics U [0.50]

PHYS*7770 Special Topics in Physics U [0.25]

PHYS*7810 Fundamentals of Astrophysics U [0.50]

The fundamental astronomical data: techniques to obtain it and the shortcomings present. The classification systems. Wide- and narrow-band photometric systems. The intrinsic properties of stars: colours, luminosities, masses, radii, temperatures. Variable stars. Distance indicators. Interstellar reddening. Related topics.

PHYS*7840 Advanced General Relativity W [0.50]

Review of elementary general relativity. Timelike and null geodesic congruences. Hypersurfaces and junction conditions. Lagrangian and Hamiltonian formulations of general relativity. Mass and angular momentum of a gravitating body. The laws of black-hole mechanics.

PHYS*7850 Quantum Field Theory for Cosmology U [0.50]

Introduction to scalar field theory and its canonical quantization in flat and curved spacetimes. The flat space effects of Casimir and Unruh. Quantum fluctuations of scalar fields and of the metric on curved space-times and application to inflationary cosmology. Hawking radiation.

Prerequisite(s): PHYS*7010

PHYS*7860 General Relativity for Cosmology U [0.50]

Introduction to the differential geometry of Lorentzian manifolds. The principles of general relativity. Causal structure and cosmological singularities. Cosmological space-times with Killing vector fields. Friedmann-Lemaitre cosmologies, scalar vector and tensor perturbations in the linear and nonlinear regimes. De Sitter space-times and inflationary models.

PHYS*7870 Cosmology U [0.50]

Friedmann-Robertson-Walker metric and dynamics; big bang thermodynamics; nucelosynthesis; recombination; perturbation theory and structure formation; anisotropies in the Cosmic Microwave Background; statistics of cosmological density and velocity fields; galaxy formation; inflation.

PHYS*7880 Special Topics in Astronomy U [0.50]

Offered on demand

PHYS*7890 Special Topics in Astrophysics U [0.25]

Offered on demand

PHYS*7970 MSc Project U [1.00]

Study of a selected topic in physics presented in the form of a written report. For students whose MSc program consists entirely of courses

PHYS*7900 Special Topics in Gravitation and Cosmology U [0.50]

PHYS*7910 Special Topics in Gravitation and Cosmology U [0.25]

Plant Agriculture

PLNT*6010 Physiology of Crop Yield W [0.50]

This course covers factors affecting biomass production and yield, with primary focus on phenomena measured at the whole canopy scale. Yield-limiting abiotic stresses (temperature, water deficit, nutrient deficiency) are considered in detail, as are technical aspects of intrumentation used in crop physiology research. (Offered annually)

Prerequisite(s): PBIO*3110 or permission of instructor

PLNT*6080 Plant Disease Epidemiology and Management F [0.50]

Epidemiology and management of plant diseases caused by fungi, viruses, and bacteria. (Offered in alternate years.)

PLNT*6100 Advanced Plant Breeding I F [0.50]

The practical consideration of genetic theory and biological limitations to improving plant populations and developing cultivars will be discussed. Current and emerging breeding methodologies and sources of variation used to achieve plant breeding goals will be examined through lectures, paper discussion, site visits and invited talks.

PLNT*6110 Fruit and Vegetable Technology F [0.50]

The course is primarily intended to address science and technology aspects of fruits and vegetables, with specific reference to storage, packaging, quality, processing, products and ingredients, health regulatory properties and biotechnology issues etc. Methods of instruction include lectures and seminars. Students are evaluated during their seminar presentations, term papers and participation in discussions. (Offered in even-numbered years)

PLNT*6160 Advanced Plant Breeding II W [0.50]

Fundamentals of quantitative genetics. Topics will include gene and genotype frequencies means, variances, covariances and resemblance among relatives. Lecture topics will be expanded through discussion of classic and current papers. (Offered in odd numbered years)

PLNT*6170 Statistics in Plant Agriculture W [0.50]

The application of statistical techniques to research in plant agriculture. SAS will be the software used to perform data analysis. Emphasis will be placed on statistical principles, the design of experiments, the testing of hypotheses, and communication of findings to other scientists.

PLNT*6230 Colloquium in Plant Physiology and Biochemistry U [0.25]

An open discussion course designed to review and critically analyze contemporary issues in plant physiology and biochemistry.

PLNT*6240 Colloquium in Crop Production and Management U [0.25]

An open discussion course designed to review and critically analyze contemporary issues in crop production and management.

PLNT*6250 Colloquium in Plant Genetics and Breeding U [0.25]

An open discussion course designed to review and critically analyse contemporary issues in plant genetics and breeding.

PLNT*6260 Advanced Plant Genetics I F [0.50]

A lecture and discussion course examining the underlying principles of genetics and the recent advances in plant genetics. Topics will include: structure of the genome, experiments to measure and experimentally describe phenotypes, population structures, and molecular basis of inheritance of a phenotype.

Restriction(s): Instructor's signature required

PLNT*6270 Agroecosystem Design and Function F [0.50]

This lecture-based course critically analyzes the agroecosystem in field crop, horticulture, turfgrass and greenhouse industries. Agroecosystem design is considered in relation to key components such as crop rotation and management of soil, nutrient and water supply. The significance of plant function, soil properties, and nutrient and water cycles to agroecosystem design are examined. Metrics of productivity and environmental sustainability serve to focus discussion on agroecosystem optimization.

PLNT*6280 Invasive Plant Ecology in Natural and Agricultural Systems W [0.50]

This course will focus on the ecological principles that are important in understanding the potential for a plant species to become invasive. Students will be able to use this knowledge to facilitate management of these species under field conditions.

Prerequisite(s): CROP*4240 or BOT*2100 or BOT*3120

PLNT*6290 Advanced Plant Genetics II W [0.50]

A lecture and discussion course examining classical and molecular genetic investigations for understanding the genetic basis and regulation of physiological processes in plants. (Offered in even-numbered years)

PLNT*6320 Metabolic Processes in Crop Plants F [0.50]

A comprehensive examination of the metabolic mechanisms and versatility whereby autotrophic organisms sustain themselves. Emphasis will be placed on our current understanding of the regulation and integration of metabolic processes in plants and their physiological and agricultural significance including available research methodologies.

Prerequisite(s): one undergraduate course in biochemistry
Restriction(s): no auditing without permission of Instuctor

PLNT*6330 Metabolism of Natural Products in Plants W [0.50]

A comprehensive analysis of the metabolism and roles of natural products in plants. Emphasis will be placed on the distinction between secondary and primary processes, and the composition, detection, and regulation of the biosynthesis, modification and turnover of natural products. Key research methodologies and the roles of natural products in abiotic and biotic stresses and their effects on human health will be discussed. (Offered in even numbered years)

PLNT*6340 Plant Breeding F [0.50]

This course examines principles of plant breeding in self- and cross-pollinted crops. Additional topics include crop domestication, mating systems, heritability, gain from selection, disease resistance, polyploidy, marker assisted selection and government regulations.

Restriction(s): MBG*4160

PLNT*6400 Seminar F,W [0.25]

All graduate students present a departmental seminar on their research proposal no later than the second semester. Each student is expected to participate in the seminars of colleagues and faculty.

Restriction(s): Restricted to thesis-based students

PLNT*6450 Plant Agriculture International Field Tour U [0.25]

A field course designed to increase student's knowledge of primary field and animal agricultural production systems. To explore the environmental and political issues related to international agriculture and to understand the role of agri-business in the rural economy.

Restriction(s): CROP*4260 if PLNT*6450 is field tour to mid-west USA

PLNT*6500 Applied Bioinformatics W [0.50]

The goal of this course is to provide an introductory understanding of the databases and methods used in computational molecular biology research. Topics covered will include: reviewing major molecular databases and their structures, constructing sequence alignments, constructing phylogenics, and finding motifs and genes in biological sequences. Lab sessions will include an introduction to Unix and Perl for the biologist and hands-on use of several molecular data analysis programs.

Prerequisite(s): Undergraduate level statistics class (such as STAT*2040 or STAT*2100) and undergraduate level molecular biology class (such as MBG*2020).

PLNT*6800 Special Topics in Plant Science U [0.50]

A study of selected contemporary topics in plant science. Proposed course descriptions are considered by the Department of Plant Agriculture on an ad hoc basis, and the course will be offered according to demand.

Political Science

POLS*6000 Comparative Approaches to Political Science U [0.50]

In this course, the students examine the main theoretical frameworks and debates in political science and the ways in which these conceptual approaches guide empirical analysis and explain political behaviour. Examples include neo-institutionalism, political culture, Marxism, feminist and identity based approaches.

POLS*6050 Gender and Politics U [0.50]

This course will survey theoretical approaches to gender, primarily feminist analysis. Through selected readings, students will be introduced to gender as an approach to examining current political problems such as social policy, security or development.

POLS*6210 Conceptions of Canada U [0.50]

This course will explore evolving conceptions of Canadian identity and nationalism through consideration of political culture, institutions and constitutional arrangements. Possible topics include: multiculturalism, aboriginal identity and community, Quebec nationalism, social citizenship, rights and representation, as well as Canada's global role and significance.

POLS*6250 Comparative Governments in the Americas U [0.50]

This course provides the theoretical and methodological foundation for the analysis of Canada, the United States, and Latin America and the Caribbean. Methodological issues in the analysis of constitutional regimes and theoretical frameworks for the comparative analysis of political institutions are examined.

POLS*6290 The American Political System U [0.50]

This course examines the institutions, processes and policies of the government and politics of the United States. Seminar discussion focuses on evaluating approaches to the study of the American system. Topics to be covered include Congress, interest groups, executive-legislative relations and reinventing government.

POLS*6370 Latin America and the Caribbean U [0.50]

The analysis of the political development of Latin America and the Caribbean looking at the context, ideologies, structures, processes and effects of policy formulation and implementation.

POLS*6390 Environmental Politics and Policy U [0.50]

This course analyses environmental actors, movements, institutions, processes and policies across national, sub-national regional and/or global levels of governance utilizing a range of environmental perspectives and theories. Depending on the instructor(s), different case studies of critical and contemporary environmental policy issues will be explored.

POLS*6400 Comparative Social Policy U [0.50]

In this course, students will study social policy in comparative perspective. Theoretical models and various policy fields will be examined in order to understand welfare state development and retrenchment. Policy fields may include immigration, health, child care and income.

POLS*6450 International Political Economy U [0.50]

The course relies on theoretical approaches in IPE to examine the relationships between politics and economics across national and regional levels. The evolution of the global political economy and its globalization and state and non-state actors' responses. Issue areas may include: money and power, technology, trade, development and the environment.

POLS*6630 Approaches to Public Policy U [0.50]

This course introduces students to the main theoretical approaches utilized in understanding public policy making and outcomes. Throughout the course, particular attention is paid to varying conceptions of institutions, ideas and interest and the role of these conceptions in various explanations of policy change and stasis.

POLS*6640 Canadian Public Administration: Public Sector Management U [0.50]

This course examines the growth of the administrative state in Canada, especially in the post World War II period. It critically reviews issues such as the concept of public sector management, the delegation of authority, personnel management, accountability and the ethics of ministers and officials to Parliament and the public.

POLS*6730 The Politics of Development and Underdevelopment U [0.50]

This course, for MA students specializing in international and comparative development, has a primarily theoretical orientation, focusing on the main paradigms that have evolved to explain central problems and issues of development and underdevelopment, particularly modernization theory, dependency theory, world-systems theory and Marxist state- theory.

POLS*6750 Development in Practice U [0.50]

This course examines the politics of international development policy and practice. Drawing upon theories of development and underdevelopment, it examines the role of transnational regimes, international institutions, national governments, and NGOs in the provision of international development assistance.

POLS*6800 Public Policy and Governance - Selected Topics F [0.50]

This course explores concepts, theories and methods of public policy analysis and governance practices and questions; the factors that influence a state's ability to design, coordinate, implement and learn from policy interventions; the intellectual forces and conceptual-theoretical frameworks that underpin the literature.

Restriction(s): Doctoral students only.

POLS*6810 Core Seminar in Comparative Politics W [0.50]

This PhD seminar course will familiarize students with themes and theorists in comparative politics.

Restriction(s): Doctoral students only.

POLS*6900 Pro-Seminar U [0.25]

This course is a 0.25 credit course introducing students to graduate studies in the department and to the profession of political science. It includes information on the following: formation of a student's faculty advisory committee; preparation of research proposals for thesis and major papers; library orientation; research using the WWW and computers; and discussion of faculty research. All graduate students are required to take this course. The course is graded satisfactory (SAT) or unsatisfactory (UNS).

POLS*6940 Qualitative Research Design and Methods U [0.50]

This course focuses on the elements of designing and writing a research question and proposal. It further examines a variety of research methods, such as the case study, comparative and survey methods. Data collection techniques also are examined.

POLS*6950 Specialized Topics in Political Studies U [0.50]

This course is intended to be an elective course for students wishing to pursue an area of investigation not covered in the other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

POLS*6960 Directed Readings U [0.50]

This is an elective course for students wishing to pursue an area of investigation not covered in other courses offered by the department. This course may also be chosen by students who want to further pursue a subject area to which they were introduced in a previous course.

POLS*6970 Major Paper U [1.00]

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters. The length of the major paper is not to exceed 10,000 words.

Population Medicine

POPM*6100 Seminar F [0.00]

A practical course that utilizes tutorials, workshops, self and peer reviewed assessment to help participants develop skills in public speaking and presentation of scientific data. Each student presents at least one seminar on an approved subject during the departmental seminar series.

POPM*6200 Epidemiology I F [0.50]

This course covers concepts, principles and methods of basic and applied epidemiology, including the following topics: sampling, measuring disease frequency, clinical epidemiology, descriptive epidemiology, causal reasoning and design, interpretation and critical appraisal of surveys, observational studies, field trials and critical appraisal.

Restriction(s): MPH and Population medicine students. All others must obtain instructor's signature.

POPM*6210 Epidemiology II W [0.50]

Advanced study design and analytic methods for the analysis of data from observational studies and surveys.

POPM*6220 Analytical Epidemiology S [0.50]

This course focuses on the advanced analysis of epidemiologic studies. Case control, cohort and survival studies are analysed within the generalized linear-model framework. Links between study objectives, study design and data analysis will be emphasized throughout. Special problems, such as the analysis of correlated data arising from cluster sampling of individuals, are discussed.

Prerequisite(s): POPM*6210 and POPM*6290

POPM*6230 Applied Clinical Research F [0.50]

This course is designed to help clinical researchers design, fund, and analyze their clinical research. Emphasis is placed upon planning a well-designed clinical trial and writing a well-organized grant proposal.

POPM*6250 Project in Epidemiology S [1.00]

Collection and analysis of field data and the preparation of a written report suitable for publication, and oral presentation of the findings to the graduate faculty. This course is part of the MSc program by course work in epidemiology.

POPM*6290 Statistics for the Health Sciences F [0.50]

This course gives an overview of advanced methods for the analysis of data of clustered/correlated data. Special emphasis is on spatial, longitudinal and survival data.

Prerequisite(s): POPM*6210 (or equivalent graduate course from another university)

POPM*6350 Safety of Foods of Animal Origins F [0.50]

The detection, epidemiology, human health risk, and control of hazards in food of animal origin.

Restriction(s): Offered by distance education only.

POPM*6400 Dairy Health Management * S [0.50]

This course stresses a population-based, herd-level approach to dairy herd health management, in which optimizing the efficiency of the dairy enterprise is the overall goal. The biological and economic impacts of disease and management deficiencies on herd performance will be discussed as they relate to design and implementation of herd health programs. The course will emphasize the critical role of record keeping, data analysis and monitoring on program success.

POPM*6510 Community Health Promotion F [0.50]

The objective of this course is to provide students with an understanding of public health, population health and health promotion. Topics will include perspectives on health and illness, injury prevention, determinants of health, population diversity and the role of evidence in public health decision-making.

POPM*6520 Introduction to Epidemiological and Statistical Methods F [0.50]

This is a 0.5 credit introductory graduate course for MPH students and students interested in epidemiology. The course will provide an introduction to research design, grant proposal writing, and critical appraisal, as well as survey (questionnaire) design and basic statistical methods for epidemiological studies.

Co-requisite(s): POPM*6200

POPM*6530 Communication I W [0.50]

This course introduces the theory of public health communication and emphasizes the development of communication skills related to public health.

Restriction(s): MPH students. All others must obtain instructor's signature.

POPM*6540 Concepts in Environmental Public Health W [0.50]

This course covers the main concepts of environmental public health including basic elements of environmental toxicology, risk analysis, air and water quality, food safety, waste, occupational health and eco health.

POPM*6550 Public Health Policy and Systems W [0.50]

This course covers concepts and principles of public health policy and systems including: public health systems, their structure, funding and governance and their integration into the healthcare system; evolution of public health policy; models of policy development and analysis; stakeholder analysis; and, public health ethics.

POPM*6560 Public Health Practicum U [1.00]

In this 1.0 credit course, students will synthesize theoretical concepts, learned via prior coursework, with public health practice. Students will work in a host public health agency for a 12-to 16-week period, focusing on a major project of significance to the host organization.

Prerequisite(s): POPM*6200, POPM*6510, POPM*6520, POPM*6530, POPM*6540, and POPM*6550
Restriction(s): MPH students only. All others instructor's signature required.

POPM*6570 Communication II W [0.50]

This course is a capstone course for the MPH program as students reflect on, interpret and present their practicum in a variety of formats. The course also focuses on the practice of public health communication, including ethical considerations, message framing and the development of a public health communication campaign.

Prerequisite(s): POPM*6560 or instructor's signature required

POPM*6580 Public Health Administration F [0.50]

This course will teach students to develop, implement and evaluate public health programs. Knowing an organization’s mission and priorities, developing strategic plans and conducting a cost-benefit analysis is critical for an effective administrator. Furthermore, conducting a program evaluation, understanding the role of advocacy is vital.

POPM*6610 Theriogenology of Cattle * U [0.50]

A lecture/seminar course emphasizing the relationship of nutritional, genetic, endocrine, anatomic, and environmental factors with the reproductive health of cattle. Application of reproductive technologies will also be covered.

POPM*6630 Theriogenology of Horses * U [0.50]

A lecture/seminar course covering the genetic, endocrine, anatomic and environmental factors that affect reproductive performance and health of horses. Breeding management, including recent technologies, and management of the infertile animal will be included.

POPM*6650 Theriogenology of Dogs and Cats * U [0.50]

A seminar/lecture series that includes the theory and management of clinical reproduction for the dog and cat, including use of developing technologies.

POPM*6670 Theriogenology of Small Ruminants * U [0.50]

A seminar/laboratory course emphasizing advanced reproductive management of sheep, goats and farmed deer/elk, with the emphasis on a sheep production model. New reproductive technologies will be included.

POPM*6700 Swine Health Management * U [0.50]

Diseases of swine are studied with particular emphasis on preventive medicine and herd-health management.

POPM*6950 Studies in Population Medicine U [0.50]

Assigned reading and/or special projects selected to provide in-depth study of topics appropriate to the specialized interests of individual students. Courses offered under this title have included Special Topics in Public Health; Ecology and Health; Systems Approaches; and Animal Welfare. Different offerings are assigned different section numbers.

Psychology

PSYC*6000 Developmental Psychopathology: Etiology and Assessment U [0.50]

The interaction of neurobiological, physiological, familial and social factors to an understanding of developmental psychopathology is the focus of this course. Emphasis is given to etiology and clinical assessment issues.

PSYC*6010 Learning Disorders: Research and Clinical Practice U [0.50]

This course examines various cognitive, social, and educational components of learning and language disorders and accompanying clinical methods of diagnosis and remediation.

PSYC*6020 Clinical and Diagnostic Interviewing Skills S [0.50]

This course provides practical training in clinical and diagnostic interviewing. Through role-play, direct observation, and in-vivo practice, students will learn how to conduct assessment and diagnostic interviews, and clinical dialogues with children and adults. This course is open only to graduate students in the CP:ADE field.

Prerequisite(s): Completion of all MA level course work except for the thesis
Restriction(s): Open only to graduate students in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field

PSYC*6060 Research Design and Statistics U [0.50]

This course covers non-parametric and parametric hypothesis testing and estimation, analysis of variance and covariance, and multiple correlation and multiple regression. Current controversial issues are presented.

PSYC*6190 Research Project U [1.00]

This course is an option for students in the applied streams of MA studies who do not plan on proceeding to a PhD program. Under the supervision of a faculty member, students will design and conduct an empirical investigation in their area of emphasis.

PSYC*6270 Issues in Family-Related Social Policy U [0.50]

This doctoral course examines historical developments and selected contemporary policy domains in Canada. Topics may include policies affecting children, families, the elderly, First Nations people, the mentally and physically disabled, and one parent families. The course also addresses the interplay between social and psychological research and policy formation, as well as the use of social policy as an instrument of social change.

PSYC*6380 Psychological Applications of Multivariate Analysis U [0.50]

This course emphasizes the use of multivariate techniques in psychological research. Both predictive (e.g., regression, canonical correlation, discriminant analysis, MANOVA) and reduction (e.g., factor analysis, multidimensional scaling, cluster analysis) techniques are considered in addition to the use of both observed and latent variable structural models.

PSYC*6401 Reading Course I U [0.25]

An independent in-depth study of current theoretical and empirical issues in the student's area of specialization.

PSYC*6402 Reading Course II U [0.50]

An independent in-depth study of current theoretical and empirical issues in the student's area of specialization.

PSYC*6411 Special Problems in Psychology I U [0.25]

A critical examination of current problems relating to conceptual and methodological developments in an area of psychology.

PSYC*6412 Special Problems in Psychology II U [0.50]

A critical examination of current problems relating to conceptual and methodological developments in an area of psychology.

PSYC*6471 Practicum I U [0.50]

Students will gain 2-3 days per week of supervised experience in a setting related to their field of specialization.

PSYC*6472 Practicum II U [1.00]

See PSYC*6471 . Students work four to five days a week in the selected setting.

PSYC*6473 Practicum III U [0.25]

See PSYC*6471. This course is intended for students who wish to gain additional practicum experience after completing the requirements for PSYC*6471/PSYC*6472. Students work one day a week in the selected setting.

PSYC*6521 Research Seminar I U [0.25]

An in-depth review of current theoretical and empirical developments in topic areas related to the student's area of specialization.

PSYC*6522 Research Seminar II U [0.50]

An in-depth review of current theoretical and empirical developments in topic areas related to the student's area of specialization. The course requirements may include the completion of an empirical research project.

PSYC*6580 Models of Child and Adolescent Psychotherapy U [0.50]

This course introduces a variety of therapeutic models for addressing problems of atypical development.

PSYC*6590 Social and Community Intervention U [0.50]

A highly applied course that focuses on the epidemiology of mental disorders, the design and implementation of preventive interventions with children, youth, and adults in the community, as well as stress and coping theory and practice.

PSYC*6610 Advanced Child and Adolescent Psychotherapy U [0.50]

This course will consider newly emerging developments in child and adolescent psychotherapy, as well as issues of power relationships, cultural sensitivity and empirical support. In preparation, students should endeavor to complete two therapy cases prior to the commencement of the course.

Prerequisite(s): PSYC*6580 and PSYC*6472 (may be taken concurrently).
Restriction(s): This course is open only to graduate students in the CP:ADE field.

PSYC*6630 Developmental Psychology U [0.50]

This course examines issues in the areas of cognitive, social, and emotional development. Specific research topics and theoretical issues concerning the nature of development are discussed.

PSYC*6640 Foundations of Applied Social Psychology U [0.50]

This course examines theory and research in social psychology, particularly in those areas most relevant to applied concerns. Topics may include attribution, attitudes, social relationships, language and communication, and self and identity.

PSYC*6670 Research Methods U [0.50]

This course emphasizes those techniques most frequently used in applied and field settings. These include: quasi-experimental designs, survey research, interviewing, questionnaire design, observational techniques, and other more qualitative methods.

PSYC*6690 Cognitive Assessment of Children and Adolescents U [0.50]

This course considers standards, ethics, uses and interpretation of selected intelligence and other cognitive tests. Students administer tests, score, interpret and write reports under supervision. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

Restriction(s): This course is open only to graduate students in the CP:ADE field.

PSYC*6700 Personality and Social Assessment of Children and Adolescents U [0.50]

This course considers projectives, questionnaires, observations and interviews for assessing children's personality and behaviour. Students administer tests, score, interpret and write reports under supervision. As a prerequisite for PSYC*6471, a passing grade and a satisfactory rating on the practical component must be achieved.

Restriction(s): This course is open only to graduate students in the CP:ADE field.

PSYC*6740 Research Seminar in Neuroscience and Applied Cognitive Science A U [0.50]

This course will expose graduate students to some of the major theories, issues and methodologies driving research in the broad field of Neuroscience and Applied Cognitive Science. Students will learn to critically evaluate presentations by researchers as well as to communicate the results of their own research, in both a written and oral format. All first year master's students in NACS are required to enroll in this course.

PSYC*6750 Applications of Cognitive Science W [0.50]

This course surveys applications of cognitive science to the problem of optimizing human performance. Topics of discussion will include human-system interactions (including Human-Computer and Human-Vehicle), education, and cognitive rehabilitation.

PSYC*6760 Research Seminar in Neuroscience and Applied Cognitive Science B U [0.00]

This course will expose graduate students to some of the major theories, issues and methodologies driving research broad field of Neuroscience and Applied Cognitive Science. Students will learn to critically evaluate presentations by researchers in this field as well as to communicate the results of their own research, in both a written and oral format. All second year master's and doctoral students in NACS are required to enroll in this course each year of their graduate program.

PSYC*6780 Foundations of Cognitive Science F [0.50]

Cognitive Science is an inter-disciplinary field that encompasses cognitive psychology, neuroscience, philosophy, and computer science. The foundational issues and basic methodologies that define cognitive science will be discussed, with specific examples from perception, learning, memory, language, decision-making, and problem solving.

Restriction(s): Restricted to Psychology graduate students; all others by permission only

PSYC*6790 Memory and Cognition U [0.50]

This course reviews the major theories, issues and methodologies guiding contemporary research in human memory and related aspects of human cognition. Topics include the encoding and retrieval of information, the nature of representations in memory, classifications of memory, and applications to reading and eyewitness testimony.

PSYC*6800 Neurobiology of Learning U [0.50]

This course reviews the major theories, issues, and methodologies guiding contemporary research in the neurobiology of learning.

PSYC*6810 Neuropsychology U [0.50]

This course focuses on current developments in neuropsychology. Particular emphasis is placed on the aphasias, apraxias, memory disorders, and disorders of movement.

PSYC*6830 Applied Social Psychology U [0.50]

This course reviews selected theories, methods and problem areas in applied social psychology. Issues involved in the conduct and application of social research, as well as alternative paradigms for such research, are discussed.

PSYC*6840 Program Evaluation U [0.50]

This course provides an introduction to a variety of methods of social program evaluation and to the process of consultation with program staff.

Prerequisite(s): PSYC*6670 Research Methods (may also be taken concurrently).

PSYC*6880 Ethical Issues in Psychology U [0.25]

Relevant issues in the application of professional ethical standards to the practice of psychology, including consultation, field research, intervention, and decision-making models are discussed in this half course. Depending on the particular faculty and students involved, discussion emphasizes specific applications to either I/O or applied developmental/social psychology.

PSYC*6890 Legislation and Professional Practice U [0.25]

This companion course to PSYC*6880, Ethics in Psychology, provides an introduction to the Provincial and Federal legislation governing the practice of psychology. Students will become familiar with legislation relevant to professional practice with children and adults in hospital, educational, community, and other settings.

Co-requisite(s): PSYC*6880

PSYC*6900 Philosophy and History of Psychology as a Science U [0.50]

This doctoral course examines the philosophical and metatheoretical issues involved in the scientific analysis of human experience. Both the historical context of these issues and the status of current metatheoretical debates are covered.

PSYC*7010 Recruitment and Selection: Methods and Outcomes U [0.50]

The course explores organizational issues in the recruitment and selection of new employees. Topics may include: individual differences, human rights, survey-based job analysis, recruitment methods and outcomes, selection methods and outcomes, hiring, decision making and employee placement/classification.

PSYC*7020 Employee Performance U [0.50]

This course focuses on issues that relate to employee performance. Individuals and organizations are interested in maximizing the contributions of employees at work. This course focuses on performance-based job analysis, criterion theory, performance management/appraisal, employee socialization, compensation, benefits, technology, and labour relations.

PSYC*7030 Work Attitudes and Behaviour U [0.50]

This course examines micro-level influences on organizational behaviour. Topics may include: organizational commitment, job satisfaction, emotions, other work attitudes and attitude change, organizational citizenship behaviours, withdrawal behaviours, employee well-being, deviance, and work-life integration.

PSYC*7040 Social Processes in the Workplace U [0.50]

This course examines social processes in the workplace. Topics may include: groups, teams, and intergroup processes; justice; diversity in the workplace; prejudice and discrimination; harassment and unethical behaviour; climate, culture change; and, organizational development.

PSYC*7050 Research Seminar in Industrial/Organizational Psychology U [0.00]

This course will expose graduate students to some of the major theories, issues, and methodologies driving research in the field of Industrial/Organizational psychology. Students will learn to critically evaluate presentations by researchers in this field, as well as to communicate the results of their own research, in both written and an oral format. All students are required to enroll in this course.

Restriction(s): Psychology students only.

PSYC*7070 Psychological Measurement U [0.50]

Concepts and applications of classical measurement theory, especially reliability and validity of tests and measurements used in applied psychology. Principles of test construction, standardization, norming, administration, and interpretation are discussed, as well as integration of test information and its use in decision making.

Restriction(s): Instructor's signature required

PSYC*7080 Consulting in Industrial/Organizational Psychology U [0.00]

The course introduces students to consulting in I/O Psychology through actual consulting projects with locali organization. Topics include: marketing consulting services, understanding consulting, client and project management. Specific projects will vary from semester to semester based on work secured with local organizations (e.g. training, surveys, coaching).

Prerequisite(s): Registration in the graduate IO psychology program and permission of the Instructor.

PSYC*7130 Introduction to Industrial/Organizational Psychology U [0.50]

This course introduces graduate students to a broad range of topics in Industrial/Organizational psychology. It emphasizes researcher-practitioner issues, consumer behaviour, professionalism, ethics, and theory building. As well, graduate students will learn about contemporary issues in I-O Psychology.

PSYC*7140 Industrial/Organizational Psychology Special Topic Doctoral Research Seminar U [0.50]

Participants investigate a specific area of Industrial/Organizational psychology. They critically review past and current research, including theory development and empirical findings. Participants work together to integrate past theory and findings, to note inconsistencies in the literature, and to identify promising areas for future investigations.

Prerequisite(s): PSYC*7130

PSYC*7160 Employee Development: Methods and Outcomes U [0.50]

This course explores development in an organization context. Employee learning and development is a key focus for employees and organizations. This course covers functional job analysis, career development, succession management, multi-source feedback, training, coaching/mentoring and employee counseling.

PSYC*7170 Industrial/Organizational Psychology Doctoral Research Internship I U [0.50]

Participants work with an Industrial Organizatonal faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript.

Prerequisite(s): PSYC*7130
Co-requisite(s): PSYC*7140
Restriction(s): Instructor's signature required

PSYC*7180 Industrial/Organizational Psychology Doctoral Research Internship II U [0.50]

Participants work with an Industrial Organizatonal faculty member to conduct research on a topic of mutual interest (other than their doctoral research). They collect and/or analyze data and write up results with the goal of producing a conference presentation and/or a quality publication manuscript.

Prerequisite(s): PSYC*7130, PSYC*7140, PSYC*7170
Restriction(s): Instructor's signature required

PSYC*7190 Work Motivation and Leadership U [0.50]

This course examines theories, research, and application of work motivation and leadership within an organizational context. The course will include a description of classic and contemporary theories of work motivation and leadership, a critical evaluation of the research findings, and a discussion of the application of the research findings to the work environment.

Restriction(s): Psychology students only.

PSYC*7991 CP:ADE Clinical Practicum I U [0.25]

This CP:ADE practicum is typically undertaken at the Center for Psychological Services, one day a week over a semester, to enhance skills introduced in other clinical courses. Expectations for the course will be based on the student's current level of clinical skill. Students will work with diverse clients, and gain knowledge of ethics and jurisprudence in a clinical setting.

Restriction(s): Restricted to Psychology students only

PSYC*7992 CP:ADE Clinical Practicum II U [0.50]

This CP:ADE practicum is undertaken in a school board, psychological services department for two days a week over one semester. Students will develop clinical assessment skills with a diversity of clients, work with interdisciplinary teams, and apply knowledge of ethics and jurisprudence to educational settings.

Prerequisite(s): PSYC*6010, PSYC*6690, and PSYC*6700
Restriction(s): Restricted to students in the CP:ADE area of specialization

PSYC*7993 CP:ADE Clinical Practicum III U [1.00]

This CP:ADE practicum is undertaken in a children's mental health setting two days a week over two semesters. Students will develop complex assessment and therapy skills with diverse clients, work with interdisciplinary team, and apply knowledge of ethics and jurisprudence to mental health settings.

Prerequisite(s): PSYC*6471 or PSYC*7992
Restriction(s): Restricted to students in the CP:ADE area of specialization, Instructor's signature required.

PSYC*8000 Clinical Internship U [0.00]

A mark of satisfactory (SAT) in this course indicates that a student in the Clinical Psychology: Applied Developmental Emphasis (CP:ADE) field has successfully completed a full year (1800-2000 hour) internship in an accredited clinical setting (e.g., CPA or APA) approved by the Director of Clinical Training for CP:ADE.

Prerequisite(s): Completion of all course work in the CP:ADE field, the PhD qualifying examination, and the PhD Thesis proposal at the time of application, one year in advance of beginning the clinical internship.

Rural Planning and Development

RPD*6030 International Rural Development Planning: Principles and Practices U [0.50]

This course presents the scope and nature of international development planning and alternative roles for development planners; has a rural emphasis; reviews the evolution of development planning from macroeconomic beginnings to more integrated local planning approaches; examines the development planning process and its organizational and spatial dimensions; compares policy, program, project, sectoral and integrated area planning; and compares rural development planning in market, mixed and state-driven societies.

RPD*6070 Project Development: Principles, Procedures, and Selected Methods U [0.50]

This course introduces students to the principles, procedures and methods in developing a project. It examines the project cycle: identification, preparation, appraisal, implementation/supervision, monitoring and evaluation. It gives an understanding of the major methods involved and teaches selected methods. The focus is on the international, rural context and on small non-farm projects: small industries, small physical infrastructure and social projects.

RPD*6080 Environment and Development: Biophysical Resources and Sustainable Development in Rural Environments U [0.50]

This course will examine the problems and potential for ecologically sustainable development in the context of rural development planning particularly in the Third World environments. The course critically examines the strategic planning approaches and methods which involve the interaction between social systems and natural ecosystems in the context of planned intervention and change in rural environments.

RPD*6170 Rural Research Methods U [0.50]

The course provides rural planning and development professionals with a number of theoretical frameworks and practical approaches to problem solving in rural Canadian and international contexts. The course content provides an introduction to hypothesis development, data collection, analytical frameworks, research management, and information synthesis and presentation methodologies that are appropriate to the practicing rural planner and developer. It views the roles of the researcher and research as interventionist and intervention in the rural community. Research methods are discussed as an integral and supporting part of the planning and development process.

RPD*6220 Planning and Development Policy Analysis U [0.50]

Planning and development policy has experienced a significant evolution. This course examines the history of policy, and the theory, methods and processes of policy development and governance in planning and management of environment and resources.

RPD*6240 Planning and Development Theory U [0.50]

Examines basic concepts, theories and perspectives in rural planning and development. A conceptual examination of 'rural', 'planning' and 'development' precedes an examination of how rural planning and development is viewed from alternative, often conflicting theories of rural change and planned intervention. The implications for practice are discussed.

RPD*6250 Public Administration in Rural Communities U [0.50]

An introduction to the nature and problems of government and administration in the small municipality (less than 25,000). Major topics include: municipal law, capital budget and implementation, public services and infrastructure, personnel management.

RPD*6260 Land Use Planning Law U [0.50]

An introduction to the legal tools used to regulate the use of land and other resources. Zoning, subdivision controls, development control, land banking, expropriation, planning appeals, official maps, etc. An intensive study of the Ontario Planning Act and related legislation.

RPD*6280 Rural Planning Methods U [0.50]

Basics of rural planning practice, including communications, graphics, group dynamics, interviews and community surveys, questionnaire design and non-parametric statistics and role of citizen participation.

RPD*6290 Special Topics in Rural Planning and Development U [0.50]

Selected study topics focus on the nature of rural planning and development issues and/or practices in Canadian and/or International small communities and rural environments. Among the topics which may be addressed are: rural land use planning, ecological restoration, gender analysis in development planning, GIS in agricultural development, micro-credit, physical/site planning and design, project management and development administration.

RPD*6291 Rural Development Administration U [0.50]

This course explores the administration of rural development by considering the main organizational types delivering rural programs. The structure and behaviour of these organizations, their interactions, and their respective sectors will be considered. Students will also be introduced to administrative planning tools.

RPD*6310 Environmental Impact Assessment U [0.50]

This course deals with the role of environmental impact assessments and statements in the planning, development and operation of resource projects. Topics discussed include the philosophical and institutional basis for environmental impact assessments, methods used and the effects of such assessments on resource development projects.

RPD*6320 Water Resource Management U [0.50]

The course provides an assessment of the processes and principles which underlie comprehensive water resource planning and integrated basin management. It also undertakes to evaluate current practice in the context of integrated planning. There is extensive use of Canadian and international practice.

RPD*6360 Major Research Paper U [1.00]

Students not pursuing the thesis route must satisfactorily complete a Major Research Paper. The paper will be supervised by a faculty committee. Content of the paper will generally focus on the placement of a problem in rural planning and development practice using appropriate methodological and analytical procedures. Note: This is a one semester course and must be completed in the semester of registration. Instructor's signature required.

Restriction(s): For Major Paper option only

RPD*6370 Economic Development Planning and Management for Rural Communities U [0.50]

Theories and perspectives of local economic development, particularly community-based planning for rural economic development. Economic development within a community development framework, and challenges of sustainable development. Interdisciplinary perspectives and alternative approaches to professional planning practice, strategic planning, management and organizational design/development issues. Alternative economic concepts and perspectives are critically examined. Includes international case studies.

RPD*6380 Application of Quantitative Techniques in Rural Planning and Development U [0.50]

Analysis and application of standard quantitative, statistical and computer-based techniques utilized in rural planning and development. Problems of data collection, analysis and interpretation.

RPD*6390 Rural Social Planning U [0.50]

This course will provide students who have an interest in social development with an avenue for linking that interest to the policy, planning and intervention process.

RPD*6410 Readings in Rural Planning U [0.50]

A program of supervised independent study related to the student's area of concentration. Nature and content of the readings course are agreed upon between the student and the instructor, and are subject to the approval of the student's advisory committee and graduate committee.

Restriction(s): Instructor's signature required.

RPD*6450 Recreation and Tourism Planning and Development U [0.50]

This course is intended to instruct the student in the principles of planning for recreation and tourism development. Emphasis is placed on the economic and social benefits and costs that accrue from tourism and recreation development. Planning principles are applied to this context.

Rural Studies

RST*6000 Sustainable Rural Systems F-W [1.00]

Sustainable development theory in the rural communities and environment context.

RST*6100 Integrative Research Methods F-W [1.00]

Research design and evaluation with a focus on measures of sustainability and on interdisciplinary applications.

RST*6300 Research Seminar U [0.25]

RST*6500 Special Topics U [0.50]

RST*6260 Research Design U [0.50]

Sociology

SOC*6070 Sociological Theory F [0.50]

Classical and contemporary theoretical perspectives and their inter-relationships. A central concern will be to develop the student's ability to assess theory critically and to understand how theory and research relate to each other.

SOC*6130 Quantitative Research Methods W [0.50]

The application of multiple regression to data generated by non-experimental research, e.g., survey data and data from other sources (census, archival). In large part a course in theory construction, a thorough grounding in the mechanics and statistical assumptions of multiple regression is followed by its application to the construction of structural equation (or causal) models representing substantive theories in sociology and related disciplines.

SOC*6140 Qualitative Research Methods F [0.50]

An examination of the methods of qualitative research, including participant observation and unstructured interviews, as well as the ethical considerations of fieldwork. Other topics, such as comparative and historical methods, may be included.

SOC*6270 Diversity and Social Equality U [0.50]

This course will examine a range of approaches used in the study of intergroup relations, with special emphasis on struggles over influence and power. Students will acquire a deeper understanding of the complex intersection, as well as the overlap among forms of identity and group mobilization based on ethnic, linguistic, regional, class, gender, racial and other forms of social division. The course may also cover native issues and policies related to multiculturalism, equity and local or regional autonomy.

SOC*6350 Society, Crime and Control U [0.50]

This seminar course surveys classical theoretical perspectives and more recent theoretical developments in the sociology of crime. It will examine the assumptions and logical structure of each perspective and justifications of particular criminal justice/public policy responses. The course will also critically assess recent empirical research relevant to each perspective.

SOC*6420 Global Agro-Food Systems, Communities and Rural Change U [0.50]

This course will reflect recent sociological interests in food studies and global agro-food systems, resources and the environment, community sustainability, rural-urban linkages, the transnationalization of labour regimes, and social movements in the rural context. The course will encourage students to take a comparative and historical approach, focusing on cross-national and inter-regional studies where possible, and to examine how class, gender, race and ethnicity play out in each particular substantive topic comprising the rural field.

SOC*6460 Gender and Development F [0.50]

Cross-cultural and historical changes in gender relations and the roles/positions of women brought about by industrialization and the development of the world system. Critical examination of the predominant theories of gender relations, in so far as these inform development research and action in societies with different socio-economic systems. Introduction to the latest theories and research in the area of women and development, as well as with social and political actions undertaken by women themselves. This is one of the two alternative core courses for the collaborative International Development Studies program.

SOC*6480 Work, Gender and Change in a Global Context U [0.50]

This course will consider some of the theoretical frameworks available for examining work, workers and work places in the context of globalization, economic restructuring, and shifts in public policy. Using case studies of particular work worlds, the course may include topics such as changing patterns of work and employment in comparative contexts, labour regimes, industrial and organizational change, organizations and protest, education for work, and the regulation of work. The course will focus on the dialectical relationship between the configurations of gender, class, race and ethnicity and the transformation of work.

SOC*6500 Social Movements in Latin America W [0.50]

Students will critically review the major theoretical perspectives on social movements and consider their relevance in understanding the timing, tactics, and impact of movements in Latin America. Movements to be examined may include labour, peasant, armed insurgent, indigenous, feminist, gay rights, and anti-globalization struggles.

SOC*6550 Selected Topics in Theory and Research U [0.50]

This course will be offered with varying content focusing on theory or research.

SOC*6600 Reading Course U [0.50]

A program of directed reading, complemented with the writing of papers or participation in research. Reading courses are arranged by students through their advisors or advisory committees and must be approved by the chair of the department. This course may be repeated provided different content is involved.

SOC*6660 Major Paper U [1.00]

The major paper is an extensive research paper for those who do not elect to complete a thesis. It may be taken over two semesters.

SOC*6700 Pro-seminar F-W [0.00]

The pro-seminar concerns matters involved in graduate studies and later work as a professional sociologist, including how to form a graduate advisory committee, assistantship responsibilities, presentation skills, exploration of careers in sociology, writing grant proposals, reports and articles, and teaching.

Restriction(s): Students in the MA program in Sociology only

SOC*6800 Advanced Topics in Sociology F [0.50]

This course will focus on the foundations of sociological theories and the broader philosophical context of inquiry in sociological research. Students will develop an advanced understanding of the research process through study, analysis and critical assessment of a range of theoretical and methodological approaches and issues.

Prerequisite(s): MA in Sociology
Restriction(s): Students in the PhD program in Sociology only

SOC*6810 Reading Course U [0.50]

A program of supervised independent reading, complemented with the writing of papers or participation in research. Reading courses are arranged by students in consultation with their advisor or advisory committee and must be approved by the chair of the department.

Restriction(s): Students in the PhD program in Sociology only

SOC*6820 Directed Readings U [0.50]

A program of directed readings related to the student's field of specialization. The nature and content of the course are agreed upon by the student and instructor in consultation with the student's advisor or advisory committee. The course must be approved by the chair of the department.

Restriction(s): Students in the PhD program in Sociology only

Statistics

STAT*6010 Strategies for Study Design and Regression Analysis U [0.50]

Exploratory data analysis and review of elementary statistical methods. Design and analysis strategies for both randomized and observational studies. Sample size and power computations. Mixed models. Missing data techniques. Linear, logistic and Poisson regression. The focus is on problem formulation and associated study designs and analyses for real-world problems. Statistical software (R and SAS) is used throughout.

Prerequisite(s): Honours degree with 1.5 stat credits, 1 math credit, or relevant work experience
Restriction(s): Students registered in the Graduate Diploma in Applied Statistics. Cannot be used to satisfy departmental MSc/PhD requirements.

STAT*6020 Data Analysis and Statistical Inference U [0.50]

Generalized linear and additive models, likelihood theory, Bayesian inference. Multilevel, longitudinal, and event history models. Methods for temporally and spatially correlated data. Although secure statistical foundations are laid down, the emphasis is on applications and experimental planning. Statistical software (R, SAS, BUGS) is used throughout.

Restriction(s): Students registered in the Graduate Diploma in Applied Statistics. Cannot be used to satisfy departmental MSc/PhD requirements.

STAT*6098 Graduate Diploma Project in Applied Statistics U [0.50]

A project leading to a technical report, which utilizes statistical principles and procedures in the solution of a substantive research problem. Completion of this course requires a formal presentation of the project to faculty and students.

Restriction(s): Students registered in the Graduate Diploma in Applied Statistics. Cannot be used to satisfy departmental MSc/PhD requirements.

STAT*6550 Computational Statistics U [0.50]

This course covers the implementation of a variety of computational statistics techniques. These include random number generation, Monte Carlo methods, non-parametric techniques, Markov chain Monte Carlo methods, and the EM algorithm. A significant component of this course is the implementation of techniques.

STAT*6700 Stochastic Processes U [0.50]

The content of this course is to introduce Brownian motion leading to the development of stochastic integrals thus providing a stochastic calculus. The content of this course will be delivered using concepts from measure theory and so familiarity with measures, measurable spaces, etc., will be assumed.

STAT*6721 Stochastic Modelling U [0.50]

Topics include the Poisson process, renewal theory, Markov chains, Martingales, random walks, Brownian motion and other Markov processes. Methods will be applied to a variety of subject matter areas.

STAT*6741 Statistical Analysis for Reliability and Life Testing U [0.50]

Statistical failure models, order statistics, point and interval estimation procedures for life time distributions, testing reliability hypotheses, Bayes methods in reliability, system reliability.

STAT*6761 Survival Analysis U [0.50]

Kaplan-Meier estimation, life-table methods, the analysis of censored data, survival and hazard functions, a comparison of parametric and semi-parametric methods, longitudinal data analysis.

STAT*6801 Statistical Learning U [0.50]

Topics include: nonparametric and semiparametric regression; kernel methods; regression splines; local polynomial models; generalized additive models; classification and regression trees; neural networks. This course deals with both the methodology and its application witha appropriate software. Areas of application include biology, economics, engineering and medicine.

STAT*6802 Generalized Linear Models and Extensions U [0.50]

Topics include: generalized linear models; generalized linear mixed models; joint modelling of mean and dispersion; generalized estimating equations; modelling longitudinal categorical data; modelling clustered data. This course will focus both on theory and implementation using relevant statistical software.

STAT*6821 Multivariate Analysis U [0.50]

This is an advanced course in multivariate analysis and one of the primary emphases will be on the derivation of some of the fundamental classical results of multivariate analysis. In addition, topics that are more current to the field will also be discussed such as: multivariate adaptive regression splines; projection pursuit regression; and wavelets.

STAT*6841 Statistical Inference U [0.50]

Bayesian and likelihood methods, large sample theory, nuisance parameters, profile, conditional and marginal likelihoods, EM algorithms and other optimization methods, estimating functions, MonteCarlo methods for exploring posterior distributions and likelihoods, data augmentation, importance sampling and MCMC methods.

STAT*6850 Advanced Biometry U [0.50]

Topics on advanced techniques for analyzing data from biological systems. In particular, univariate discrete models, stochastic processes as it relates to population dynamics and growth models with time dependencies, generalized discrete models for spatial patterns in wildlife, the theoretical foundation and recent results in aquatic bioassays, and other topics relating to the student's research interest.

STAT*6860 Linear Statistical Models U [0.50]

Generalized inverses of matrices; distribution of quadratic and linear forms; regression or full rank model; models not of full rank; hypothesis testing and estimation for full and non-full rank cases; estimability and testability; reduction sums of squares; balanced and unbalanced data; mixed models; components of variance.

STAT*6870 Experimental Design U [0.50]

This is an advanced course in experimental design which emphasizes proofs of some of the fundamental results in the topic. The topics will include: design principles; design linear models; designs with several factors; confounding in symmetrical factorials; fractional factorials.

STAT*6880 Sampling Theory U [0.50]

Theory of equal and unequal probability sampling. Topics in: simple random, systematic, and stratified sampling; ratio and regression estimates; cluster sampling and subsampling; double sampling procedure and repetitive surveys; nonsampling errors.

STAT*6920 Topics in Statistics U [0.50]

STAT*6950 Statistical Methods for the Life Sciences F [0.50]

Analysis of variance, completely randomized, randomized complete block and latin square designs; planned and unplanned treatment comparisons; random and fixed effects; factorial treatment arrangements; simple and multiple linear regression; analysis of covariance with emphasis on the life sciences. STAT*6950 and STAT*6960 are intended for graduate students of other departments and may not normally be taken for credit by mathematics and statistics graduate students.

STAT*6960 Design of Experiments and Data Analysis for the Life Sciences W [0.50]

Principles of design; randomized complete block; latin square and extensions the split plot and extension; incomplete block designs; confounding and fractional replication of factorial arrangements; response surfaces the analysis of series of experiments; the general linear model; multiple regression and data analytic techniques. STAT*6950 and STAT*6960 are intended for graduate students of other departments and may not normally be taken for credit by mathematics and statistics graduate students.

STAT*6970 Statistical Consulting Internship U [0.25]

This course provides experience in statistical consulting in a laboratory and seminar environment. The student will participate in providing statistical advice and/or statistical analyses and participate in seminar discussions of problems arising from research projects in various disciplines.

STAT*6990 Statistics Seminars by Graduate Students U [0.00]

STAT*6998 MSc Project in Statistics U [1.00]

Studio Art

FINA*6510 Introduction to Graduate Studio F [1.50]

A qualifying open-studio course to determine the student's interests and level of performance. The student will come in contact with a variety of faculty and may choose to work in a number of areas during this period.

FINA*6515 MFA Studio I W [1.50]

Sustained work at an independent level under the supervision of the chair of the student's advisory committee.

Prerequisite(s): FINA*6510

FINA*6530 MFA Teaching Practicum I F [0.50]

This course will give the MFA student supervised teaching experience in a studio discipline. In addition, a seminar component will consider theoretical and practical issues relevant to the teaching of studio art. Prerequisite: admission to the MFA program.

FINA*6531 MFA Teaching Practicum II F [0.50]

Continuation of teaching practicum under the guidance of a faculty member. The practicum seminar will consider theoretical and practical issues relevant to the teaching of studio art such as educational goals, course and curriculum planning, academic evaluation, health and safety policies, and appropriate materials and equipment.

Prerequisite(s): FINA*6530

FINA*6540 MFA Seminar I F [0.50]

Examination of critical issues in the visual arts relevant to studio practice

FINA*6545 MFA Seminar II W [0.50]

Continuation of issues examined in FINA*6540

Prerequisite(s): FINA*6540

FINA*6550 Selected Topics in Fine Art U [0.50]

Seminar in a fine art topic in a subject to be specified by the instructor.

Prerequisite(s): Admission to the MFA program.

FINA*6551 Seminar in Art Theory and Criticism I W [0.50]

Selected topics in art theory and criticism with particular relevance to studio practice.

Prerequisite(s): Admission to MFA program or permission of instructor.

FINA*6552 Seminar in Canadian Art U [0.50]

Selected topics in Canadian Art

Prerequisite(s): Admission to the MFA program and permission of instructor.

FINA*6554 Seminar in Nineteenth Century Art U [0.50]

Selected topics of the period.

Prerequisite(s): Admission to the MFA program and permission of instructor.

FINA*6555 Seminar in Twentieth Century Art U [0.50]

Selected topics of the period.

Prerequisite(s): Admission to MFA program and permission of instructor.

FINA*6610 MFA Studio II F [1.50]

Continuation of FINA*6515

Prerequisite(s): FINA*6515

FINA*6615 MFA Studio III W [1.50]

Continuation of FINA*6610

Prerequisite(s): FINA*6610

FINA*6640 MFA Seminar III F [0.50]

Continuation of FINA*6545

Prerequisite(s): FINA*6545

FINA*6641 MFA Seminar IV W [0.50]

Continuation of FINA*6640

FINA*6650 Individual Study in Art History U [0.50]

Students will pursue special study under the guidance of a faculty member with appropriate expertise

Prerequisite(s): Approval of the co-ordinator of the MFA program.

FINA*6651 Individual Study in Contemporary Art U [0.50]

Students will pursue special study under the guidance of a faculty member with appropriate expertise

Prerequisite(s): Approval of the co-ordinator of the MFA program.

FINA*6652 Individual Study in Art Theory and Criticism W [0.50]

Students will pursue special study under the guidance of a faculty member with appropriate expertise.

Prerequisite(s): Approval of the co-ordinator of the MFA program.

Theatre Studies

THST*6150 Theatre Historiography F [0.50]

This variable content course introduces students to the theory and practice of theatre historical analysis. The course is required of all students in the Theatre Studies MA Program.

THST*6210 Devising W [0.50]

This variable-content course addresses creative practice in the theatre as a site for the production of knowledge. It examines the theoretical and social issues of contemporary theatre practice.

THST*6220 Theatre Theory F [0.50]

This variable content course introduces students to a range of theoretical approaches and to advanced issues and methods within the fields of drama, theatre, and performance studies. The course is required for all students in the Theatre Studies MA Program.

THST*6230 Performance and Difference W [0.50]

This variable-content course introduces students to the most recent theoretical and critical international developments in the field of Theatre Studies and investigates sites of cultural diversity and difference. It provides opportunities for culturally specific studies of dramatic literature and performance.

THST*6250 Bodies and Space in Performance W [0.50]

This variable-content course introduces students to the social, ethical, phenomenological and environmental dimensions of the interaction of bodies and space in theatre practice and research. It provides a theorized context in which students may address questions of acting, directing, and design as research processes.

THST*6280 Independent Reading Course U [1.00]

Independent Reading Course

THST*6500 Research Paper U [1.00]

THST*6801 Reading Course I U [0.50]

An independent study course, the nature and content of which is agreed upon between the individual and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.

THST*6802 Reading Course II U [0.50]

An independent study course, the nature and content of which is agreed upon between the individual and the person offering the course. Subject to the approval of the student's advisory committee and the graduate committee.

Toxicology

TOX*6000 Advanced Principles of Toxicology S [0.50]

An intensive course in the principles of modern aspects of toxicology, taught in a lecture/case study format.

TOX*6200 Advanced Topics in Toxicology W [0.50]

Advanced topics in toxicology will include oral presentations by students, faculty members, and guest lecturers. The emphasis will be on advanced concepts and techniques in toxicology research with particular relevance to mechanistic, molecular and interpretive toxicology.

TOX*6530 Toxicological Risk Characterization W [0.50]

A biologically based advanced course that will give students working knowledge of current procedures and techniques for toxicological risk characterization. The course material will cover the topics: problem definition, concentration-response characterization, exposure characterization, and risk assessment and risk-management decision making. Department of Environmental Biology.

Restriction(s): Credit may be obtained for only one of TOX*6530, ENVB*6530, ENVB*4550 and TOX*4550

TOX*6590 Biochemical Toxicology F [0.50]

The molecular mechanisms of action of carcinogens and other toxic compounds. Enzymes of biotransformation, including a detailed study of cytochrome P-450. Interactions of reactive species with DNA and other macromolecules. (Credit may be obtained for only one of TOX*4590 and TOX*6590) Department of Chemistry and Biochemistry

University Courses

UNIV*6000 The Structure and Function of Muscle U [0.50]

An interdisciplinary course covering basic aspects of muscle from a range of viewpoints: structure, metabolism, protein content, energetics, mechanics, biological adaptations, growth and development. The course is designed for graduate students from a wide range of specific disciplines and will provide a broad background to muscle biology as well as more detailed insights into specific aspects of each area covered.

UNIV*6010 Regulation in Muscle Metabolism U [0.50]

An interdisciplinary course emphasizing the regulation of muscle metabolism in vivo. The course focuses on the integration of metabolic fuel utilization to meet cellular energy demands under a variety of conditions in the whole animal. Topics include: sources of energy demand, integration of energy supply to meet energy demands, and regulation of cell growth, maintenance and adaptation.

UNIV*6030 Seminars and Analysis in Animal Behaviour and Welfare F-W [0.50]

This seminar-based course offers an interdisciplinary forum for the discussion of broad topics in animal welfare and human-animal relationships. Students analyze topics presented by visiting guest lecturers using perspectives from various disciplines such animal science, philosophy, history, psychology, ethics, and biology.

UNIV*6040 Selected Topics in Critical Studies in Improvisation S [0.50]

Intended for students who have an interest in musical improvisation, this interdisciplinary course provides a forum to investigate the possibility of improvised artistic practices to inform community-building models and to shape public debate and policy decisions regarding the role of the arts in society.

UNIV*6050 The Integration of Science and Business in Agrifood Systems F-W [1.00]

Designed specifically for students enrolled in OMAFRA/UoG HQP Scholarship program but open to all students. To provide market-readiness for students as they enter business, government or academia. Teaching modules will cover business developments, intellectual property, patent and licence protection as well as societal issues impacting agriculture.

Restriction(s): Limited of 36 students. Priority to HQP Scholarship Program students.

UNIV*6060 Mechanisms of Tissue and Cellular Mechanotransduction in Health and Disease F [0.50]

This course explores fundamental mechanisms and signalling pathways that dynamically regulate cell and tissues responses to physical forces in health and disease. It is relevant to a wide range of areas of study, from biomechanics and tissue engineering to gastro-intestinal health, food and nutrition.

Restriction(s): Instructor's signature required

UNIV*6500 International Study Option U [0.00]

A period of study in another country as part of a graduate program at the University of Guelph. Details may be obtained from the Office of Graduate Studies.

UNIV*6600 Animal Care Short Course F,W,S [0.00]

The course includes on-line training modules covering the following topics: Legislation, Regulation & Guidelines, Ethological Considerations in Animal Management, Ethics in Animal Experimentation, Research Issues, The Three Rs of Humane Animal Experimentation, Occupational Health and Safety when Working with Animals, Euthanasia, Recognition and Alleviation of Pain and Distress in Animals. Graduate students using or caring for live animals or assisting in teaching courses involving live vertebrate animals also must attend the Animal Care Services species-specific Workshops as part of the Animal User Training Program.

UNIV*6710 Commercialization of Innovation F [0.50]

This course is designed to help participants better understand the process, the analytical tools that can assist the process and how best to prepare technologies to survive commercialization. The course includes elements of entrepreneurship, relationship building, organizational change, as well as project and personnel management.

UNIV*6800 University Teaching: Theory and Practice F [0.50]

Participants will critically examine aspects of teaching in higher education and develop teaching skills such as lecturing, demonstrating, leading discussions, and problem solving. Satisfactory (SAT) or unsatisfactory (UNS) will be used to evaluate the student's performance in this course.